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Truing Devices for Grinding Wheels

Use Made of Black Diamonds and Ordinary Wheel Dressers—Means Employed to Bring New Cutting Edges into Play

BY F. B. JACOBS

GRINDING wheels are in reality cutting tools revolving at high speed whereby countless sharp points remove minute chips by what we call, for want of a better term, the action of abrasion. In the strictest sense of the word, this is not correct because the word abrasion means to wear or rub, whereas a modern grinding wheel actually removes material, be it hard or soft, by a cutting instead of a wearing action. To obtain the best results the innumerable cutting points on the surface of the grinding wheel should be kept sharp and the periphery concentric with the spindle; otherwise the efficiency of the wheel is materially lowered. In this article a few simple methods for truing grinding wheels will be briefly considered.

The tools used for this purpose are of two kinds, diamonds and ordinary emery wheel dressers. There are two varieties of diamonds used, that is to say, bortz stones, which are nearly white in color, and the darker variety called black diamonds. Bortz stones are comparatively inexpensive when compared with black diamonds but they are not so

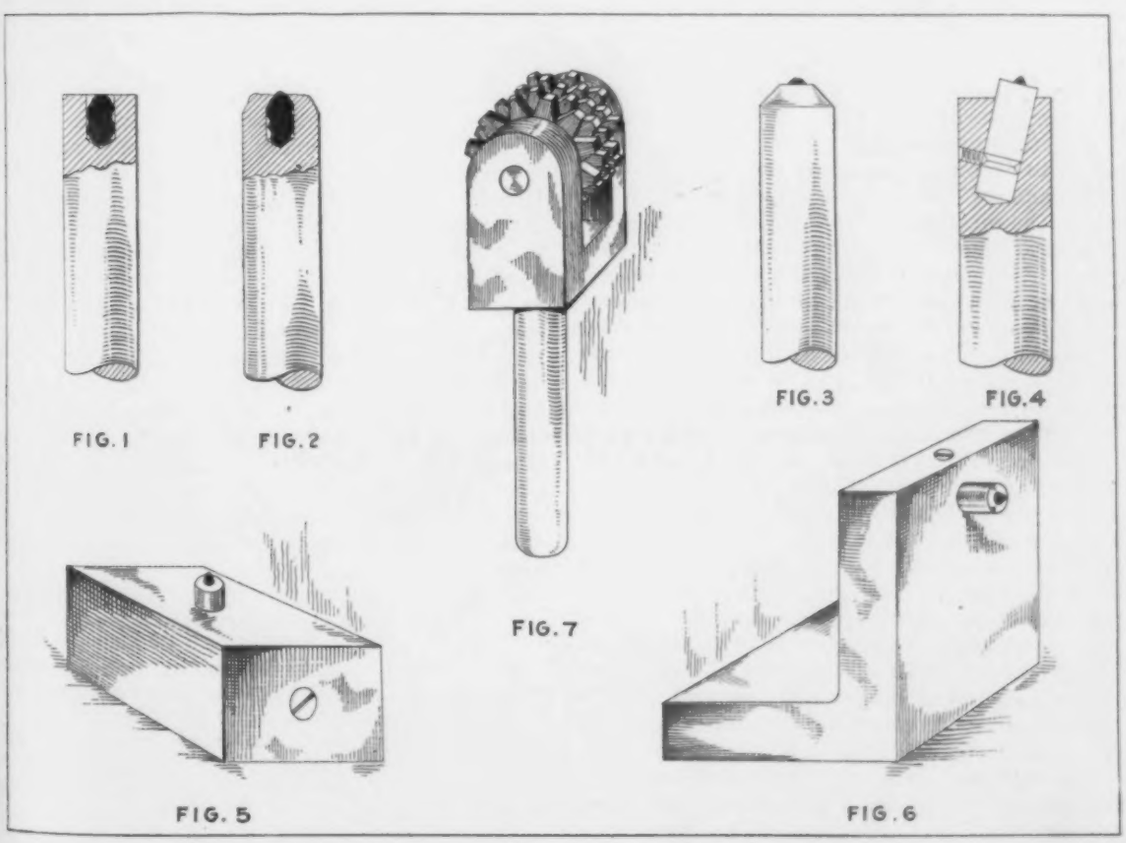


Fig. 1—The Diamond Set in a Hole in the End of a Rod
Fig. 2—The Metal of the Rod Peined Over the Stone
Fig. 3—The Completed Setting with the Metal Turned Off
Fig. 4—An Arrangement Employing an Auxiliary Plug Capable of Adjustment to Bring a New Cutting Edge Into Action
Fig. 5—Simple Device for Surface Grinding Machine Wheels
Fig. 6—Arrangement for the Wheels of Small Cutter Grinding Machines
Fig. 7—Grinding Wheel Dresser Consisting of Five Cutters Mounted in a Holder and Intended for Use Where It Is Desired Merely to Keep the Wheel Rough

GROUP OF DEVICES FOR TRUING THE WHEELS OF GRINDING MACHINES

hard and consequently are shorter lived. It is, therefore, more economical to buy black diamonds. Both varieties are sold by the carat and can be bought loose or already mounted in steel or copper holders. The majority of manufacturers prefer to buy loose stones, as by this method flaws are more readily detected, and since these stones are never guaranteed it is important to see that only good specimens are selected.

The operation of setting the stones is comparatively simple and can be intrusted to any tool maker who has the reputation of being a careful workman. In setting a stone, all workmen do not proceed along the same lines, but the following method, which is used by many tool makers, is simple and satisfactory. First select a drill of the same size as the stone. This is readily accomplished by passing the stone through the holes in an ordinary drill gage. As stated before, both steel and copper holders are used but in actual practice the latter makes the better holder for two reasons.

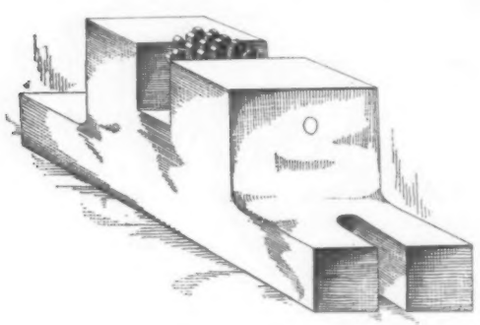


Fig. 8—Wheel Truing Device for Large Surface Grinding Machines

First it is very malleable and thus is easily worked, and also copper is an excellent conductor of heat and readily absorbs superfluous heat, thereby tending to prevent overheating the stone, which often causes it to fracture. The rod should be about 6 in. long and of the correct diameter to fit the holder on the machine where it will be used, ½ in. being a good diameter for the average sized stone. A hole is drilled in the end of the rod deep enough to bury the stone, as shown in Fig. 1. The next step is to pein over the metal which holds the stone firmly in place. This is done with a light hammer and a small staking chisel, the result being shown in Fig. 2. Care should be exercised as a diamond is quite brittle and easily broken by a chance blow. The completed setting is shown in Fig. 3, the superfluous metal having been turned away. Some tool makers prefer to braze the stone in position, and while this method no doubt holds the stone firmly in place, the heat necessary to melt the spelter is liable to crack the stone. However, as this method of brazing stones in place is often used by reliable manufacturers there certainly is some authority for employing it. The process consists of filling the hole about half full of spelter and flux, and when it has reached a molten state the stone is pressed in place, which causes the spelter to rise in the hole, thus forming a matrix that grips the stone firmly. It may be well to add that the work should under no circumstances be cooled in water, as the sudden contraction of the diamond will in many cases cause it to fracture.

Even the hardest stones will wear flat in time. Thus it is necessary to reset them occasionally, which brings a new cutting edge in position. This is done by turning the stone upside down or canting it sideways. The holder shown in Fig. 4 accomplishes this end in a very simple manner. It consists of an auxiliary plug in which the stone is mounted, fitting in a hole the axis of which is at a slight angle with that of the main holder. The plug is held in place by a set screw. When the stone becomes flattened the plug is turned slightly, which brings a new cutting edge in position. This device is covered by patents and it is not public property.

Care should be exercised while using a diamond as an undue strain caused by gouging it into the wheel often results in tearing the stone from its setting, in which event it is generally lost. In truing wheels on cylindrical grinding machines water should always be used to keep down frictional heat and several light cuts are to be preferred to a few heavy ones. It is hardly necessary to state that the tool should never be guided by the hands, as it is impossible to do a satisfactory job in this manner. Nearly all grinding machines are equipped with suitable holders to accommodate truing devices and they should always be used. The device illustrated in Fig. 5 is excellent for truing wheels on surface grinding machines. It is very simple, consisting of a diamond set in a holder 1½ in. long, which is fastened in a block of cast iron by a set screw. It can be held on a magnetic chuck or clamped in the vise. For truing wheels on various types of small cutter grinding machines an angle iron, as shown in Fig. 6, gives good results. The diamond holder is fastened by a set screw and the angle iron is clamped to the platen of the machine by a strap, bolt, or other convenient means.

We are sometimes inclined to look askance at ordinary emery wheel dressers in connection with wheels for precision grinding, but under certain limited conditions they are productive of excellent results. In ordinary cylindrical grinding it is customary to rough out several hundred pieces before taking any finishing cuts, and as we are removing stock only, paying absolutely no attention to finish, all that we desire is a fast cutting wheel. In cases of this kind a few emery wheel cutters mounted in a holder, as shown in Fig. 7, will prove a revelation to the man who has never used them. They keep the wheel rough and free cutting, which is just the condition required. For truing the wheels used on large surface grinding machines a holder, as shown in Fig. 8, will be found a valuable accessory. It should be provided with slots for clamping it in place. On a magnetic chuck, however, the force of the magnetism is sufficient to keep the holder in place. It must be borne in mind that cutters of this kind are practicable for roughing wheels only, but when we stop to consider that even a comparatively small diamond costs several dollars, whereas a set of emery wheel cutters can be purchased for a few cents, their merits are well worth consideration.

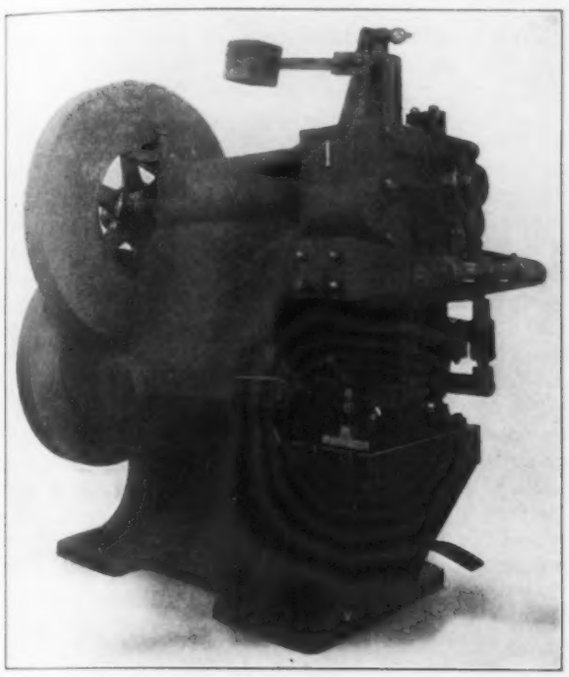
British Iron-Ore Output in 1915

An estimate of 5,100,000 tons of iron ore obtained from quarries in 1915 brings the total iron ore mined in Great Britain to 12,976,105 gross tons which includes the 6,080,218 tons mined under the Coal Mines act and the 1,795,887 tons under the Metalliferous Mines act. The total in 1914 was 14,867,582 tons, and in 1913 it was 15,997,328 tons.

The Cutler-Hammer Mfg. Company, Milwaukee, owing to its steadily increasing Eastern business, has leased larger offices in New York City. The new offices are on the nineteenth floor of the Hudson Terminal, 50 Church Street, the space being nearly double that previously occupied. W. C. Stevens is manager of this office.

Punching Machine for Ends of Rails

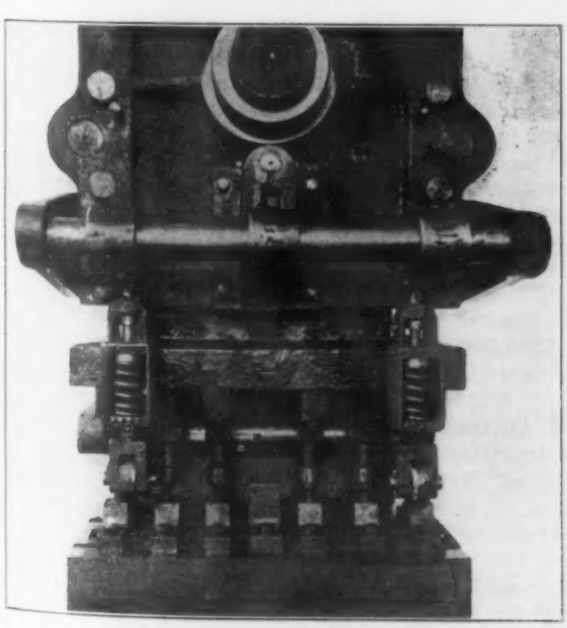
For punching the bolt holes in the ends of two light rails simultaneously, the Covington Machine Company, Covington, Va., has brought out a special



Machine for Punching the Bolt Holes in the Ends of Two Adjacent 40-Lb. Rails Simultaneously

machine. It is intended for use where the material handled does not weigh more than 40 lb. per yard, this type of rail being used principally for industrial and mine railroads and for the third-rail of electrified lines. The design of the machine, which makes it possible to punch opposite ends of two rails simultaneously, it is explained, gives the equivalent of punching both ends of the same rail in a single operation.

The machine is a special adaptation of a vertical punching machine, and has four punches, two for each rail, although the machine is heavy enough to take care of an additional punch for each rail. A stop is provided between the two gangs of punches.



The Machine Is Equipped with Four Punches, Two for Each Rail and a Stop in the Center

The die blocks are designed to fit in between the rails for punching.

A special clamping arrangement is employed, the design of which can be readily seen from the accompanying illustration. The two clamping arms employed, each having an extended lug which drops down between the flange and the bulb of the rail. An arrangement is provided for adjusting these clamping arms to any desired point near the end of the rail. A cam mounted on the main eccentric shaft controls the actual clamping. This cam engages with a roller that in turn is connected with another arm on the outer rock shaft to transmit the motion to the two arms which engage the clamping arms through a spring connection. The motion of the cam is timed to release the clamp and provide time for the rail to be slid in position for punching before the cam causes the clamping mechanism to take hold.

Belt drive is provided for the machine illustrated, although direct-connected motor drive can be employed if desired. The cross shaft of the machine is mounted in bearings and is attached to the frame back in the throat, the balance weight being keyed to this shaft. The bearings of the eccentric and driving shafts have bushings that are readily removable when desired.

American Glass Equal to the Famous Jena Glass

The forthcoming gathering of chemists and technical men in connection with the annual meetings in September in New York of the American Chemical Society, the American Electrochemical Society, the Society of Chemical Industry, and the Technical Association of the Pulp and Paper Industry, will reveal to the American public the preeminence of chemistry as a factor in the great national industries. The great scarcity of potash, due to the war, has almost crippled many of our industries, notably our fertilizer industry and some of our glass industries. However, American ingenuity and enterprise have been equal to the occasion. At the Second National Exposition of Chemical Industries, which opens concurrently with the meetings of the chemical and technical societies, the accomplishments of American glass chemists will be shown.

Germany has built up a great glass industry just as she has built up a great dyestuffs industry, producing certain qualities of glass that were formerly the despair of chemists to imitate. Nearly all the lenses for microscopes, telescopes, field glasses, cameras, etc., and almost all the glassware suitable to special chemical and philosophical purposes have been produced in Germany. The Jena glassware is famous throughout the world as the acme of perfection, and it is only within the last two years that certain American glass chemists have grasped the secret of making it. Glass for chemical use the equal of that produced in Jena, is now made in the United States, thus putting America in a position of economic independence in another great field of industry.

In its ability to produce war orders completely within its own plant, the Nova Scotia Steel & Coal Company occupies a unique position. Out of the many thousands of cars built in America, in the past year for the Russian Government, that company, with its order for 2000 cars, is probably the only builder which mined the ore, fabricated the material and delivered the cars in Asiatic Russia without calling in the aid of any other concern, either for raw material, the manufacturing or the transportation.

The Southern Foundry Company, Owensboro, Ky., has been awarded a contract for the manufacture of fittings for marine engines by the Duplex Engine Governor Company, Brooklyn, N. Y. The contract is said to be sufficient to keep the foundry busy for the next six months.

Australasian Trade with the United States

Volume Second Only to That of Great Britain—Good Promise in Machinery Lines—Zinc Concentrates and Other German Losses

BY H. M. DAVIS

IN the fiscal year ended June 30, 1915, New South Wales, Australia, imported from Great Britain articles to the value of nearly $65,000,000. The next largest imports came from the United States, amounting to $26,000,000, which represented more than the imports from all parts of the British Empire outside of the United Kingdom itself, and exceeded the imports from all of the remaining countries of the world put together. Of the total imports into this one State of Australia, the United States supplied over 19 per cent. The volume of imports into Victoria was slightly larger, with practically the same relative proportions maintained.

From Queensland, South Australia, West Australia, the Northern Territory, Tasmania, New Zealand and the outlying islands, which are counted in when considering Australasian trade, the complete figures are not available at this writing, but the total volume of imports of American goods approaches a total of $100,000,000, without counting those re-exported from England.

While imports into Australasia declined about 23 per cent as a whole, due to retrenchments caused by the war, purchases from the United States were 16 per cent greater.

The continent and islands of Australasia exported to other parts of the British Empire, including the United Kingdom, just about enough in excess of the total of imports to offset the balance of trade against the Commonwealth of Australia, Tasmania and New Zealand in the United States.

These are striking facts, and show the importance of this great market to American manufacturers. Our imports from Australasia are raw materials, while our exports represent almost entirely manufactured articles.

AMERICAN MACHINERY

The machinery and metal working trades of the United States have the greatest interests at stake in developing trade with Australia, New Zealand and the outlying islands of Australasia, as well as with the great Melanesian archipelagoes now dominated by the two commonwealths. These include mining machinery, power and electrical equipment of all kinds, blast furnaces for iron, copper, gold and silver ores, rolling mill machinery, metal and woodworking tools, saw mill machinery, flour mill machinery, well drilling outfits, pumps of every type, pipe, agricultural machinery and implements, shovels, spades and trenching tools, contractors' appliances, building and domestic hardware, auto and horse-drawn vehicles, railroad equipment and supplies of every description, for both steam and electric tramway lines; steam shovels, drag line excavators, cableways, and aerial tramways, wire rope, wire and wire products of all kinds, leather belting, rubber belting, packing and mechanical rubber supplies; in fact, almost everything which is used in any considerable quantity by a nation which depends upon the products of the ground rather than upon manufacturing.

The importation by Australia of blast furnaces for reducing iron ore and of rolling mill equipment has made a beginning through the enterprise of the Broken Hill Proprietary Company, Ltd. How far this will tend to restrict imports of heavy steel products only the future can show, but the net effect thus far seems to have been to open up a new market for material used in iron smelter and steel mill construction and equipment for the operation of such plants without lessening the volume of steel products called for, as the Australian output hardly suffices to cover the normal growth in the local demand. The company above mentioned mines its own iron ore in the celebrated Broken Hill district of South Australia. The deposits are those known as the Iron Knob and Iron Monarch, situated 30 miles inland from the west side of Spencer's Gulf, which can be readily located on any map of Australia. These were worked primarily to provide iron ore for use as flux in the company's copper smelting works at Port Pirie. Latterly, however, the ore has been shipped to blast furnaces and steel works erected near Newcastle in New South Wales, which represent an expenditure of over $7,000,000. All construction material and machinery for them were shipped from the United States.

One 350-ton blast furnace, four open-hearth furnaces and a combination structural steel and rail mill have been completed, and 60 by-product coke ovens are operated. The rail mill is rolling sections up to 100 lbs. to the yard. Billets are made from 4 x 4 up to 6 x 6 in. and 24 in. long, blooms up to 10 x 10 in. and 10 ft. in length. In structural shapes, I beams up to 15 in. deep will be rolled, together with fish plates, etc. The normal capacity is 50,000 to 60,000 tons per month. Equipment installed at present does not provide for the production of sheets, rods or wire, but the plant is so laid out that the capacity can be readily extended in any direction on the unit system.

A smaller plant, belonging to G. & C. Hoskins, exists at Lithgow, New South Wales.

According to estimates and figures recently prepared in Australia, the total yearly requirements of steel rails are considered to be about 150,000 tons, while the total imports of iron and steel in various conditions of manufacture were for 1914-15 over 400,000 tons, with a local value of about $36,500,000 based on the prices prevailing when imported, which would be greatly exceeded now. The principal items were: Pig iron, $1,080,000; plain sheets, corrugated, $4,550,000; galvanized not corrugated, $4,900,000; steel rails and fish plates, $6,230,000; bars rods and angles, $5,730,000; iron and steel wire, $3,110,000; pipe and tubes, $4,230,000.

Australian metal working plants are more important than is generally supposed by people in the United States or even in Great Britain. The volume of production from these naturally restricts imports in the lines which their activities represent; on the other hand, such production means purchases of machine tools and other shop's equipment and supplies, including tool steel, which stand for important classes of trade with American exporters.

Among Australian machinery building plants,

that of Thompson & Co., Proprietary, Ltd., of Castlemaine, Victoria, is prominent. It manufactures locomotives, boilers, dredges, air compressors, blowing engines, complete ore reduction plants, pumps, pumping engines, etc. At Brunswick, in Victoria, is the Steel Company of Australia, which makes a specialty of such work as roll shells, hydraulic cylinders, gearing of all kinds, shoes and dies, cams, tappets, slag pots and ladles, metal and matte molds, converter tops, truck and tram wheels, sprocket wheels, colliery castings, etc. Mephan Ferguson, Proprietary, Ltd., turns out wrought iron, cast iron and steel pipes and accessories from works located at Footscray, Victoria. Steel forgings are produced by the Austral Otis Engineering Company, Ltd., South Melbourne, Victoria. Trucks and cars for railroad and industrial service, up to the largest sizes, are built by Morison & Bearby, Ltd., Newcastle, New South Wales. In South Australia, at Gawler north of Adelaide are the locomotive works of James Martin & Co., who also manufacture mining machinery and heavy equipment of other kinds on order. Queensland plants are represented by the establishment of Walkers, Ltd., at Maryborough, which builds steam engines and produces special machinery for factory or other industrial uses. The above are typical of the best modern engineering works in the various States of the Australian Commonwealth. There has been complaint lately, however, that "lack of protection" prevented the development of a greater number of such local metal working industries. Difficulties which serve as present handicaps were mentioned in this paper February 10, page 383.

For the present, and during the remainder of the war, Australian machinery building plants will be practically withdrawn from competition with American or other manufacturers who have agencies in the country, owing to the fact that their facilities have been organized for the manufacture of munitions and other army and naval equipment. Even the railroad shops are using every possible tool for that purpose. Now shops are also being established for the purpose, among them being that of the Barrier Munitions Company at Broken Hill and a rifle factory at Lithgow, New South Wales. The entire equipment of that plant was ordered from the United States, and munitions work in general has opened up an entirely new line of imports from American manufacturers. Even Tasmania is providing for a munitions plant to be operated by the island government.

COAL AND ZINC

The mining of coal in Australia has reached large proportions, the center of operations being the Newcastle fields in New South Wales. The largest coke plants, copper smelters, etc., and the new iron and steel plant are consequently located within easy haulage distance. Australian coal not only competes with other coals in the Far East, but is also extensively shipped to the west coast of South America. The coal mines of Australia were on the verge of being furnished with a great deal of new equipment at the time the war started. The need for modern electrical equipment is shown by the fact that only two electric hoists are in service in the New South Wales fields, viz., at the Abermain and Richmond Main collieries.

A most noteworthy event in relations between the United States and Australia was the permission given by the authorities of the Commonwealth to ship 100,000 tons of zinc concentrates from the Broken Hill mines by Amalgamated Zinc (de Bavay's) to the United States Steel Corporation for treatment in the new 9120-retort smelter at Donora, Pa.; also 16,900 tons to other American interests. One of the principal factors in the world's zinc industry after the war will be the future disposition of these Australian ores, which are now going to the United States, France and England, instead of principally to Germany as formerly. A considerable percentage is now being stocked in Australia. If the movement to the United States continues and increases, it will confirm this country in its position as the dominant spelter producer of the world. The situation as it affects Australia was discussed in detail in THE IRON AGE of Nov. 4, pages 1050-51.

ANTI-GERMAN TRADE FEELING

Without expressing any bias or judgment in the matter, it will be in order to state that German and Austrian trade in Australia appears to be indefinitely doomed, even for many years after the conclusion of peace. Nowhere in the British Empire does feeling on this point appear to be so bitter and so unanimous as in Australia. Convictions and penalties under the "Trading with the Enemy" act have been very rigidly enforced. What is further proposed is made very clear in the following extract from a speech made in November by the Prime Minister of the Commonwealth, Hon. W. M. Hughes:

> Germany came to this country and received a hearty welcome. In our foolish trustfulness we gave her of our best. She spied out the fruitfulness of the land and gradually wormed her way into the inmost citadels of trade and industry. The best of Australian trade had fallen into her hands. But our eyes have been opened. We see the danger: the way to safety is not less plain. Toward this every man must play his part. Let every man do the job that is in front of him; in this way shall the nation be saved. The job in front of the business men of Australia is to attack German trade and destroy its every vestige. They must see that Germany has no trade in Australia from now onward. We must get rid of it, no matter what the cost . . . . Whatever legislation is necessary, so far as it lies within the power of the commonwealth, will, you may be sure, be passed. But legislation alone is not enough. What Australia expects from every Australian is this: No matter whether it profit him, no matter whether it involves risk, they must destroy this thing wherever it exists . . . To firms and companies that have German shareholders I say, 'Cut them out.' So far as the law can protect you, so far as the commonwealth can throw its mantle over you, it will be done, but it is only by a wholesouled effort on the part of the nation that German trade can be swept out of Australia.

The feeling indicated by the above seems likely to endure for a long time. One specific act taken to carry it into effect has been the suspension of "all enemy trademarks."

While most Americans will hardly agree that it is good policy to shut out any former belligerent from peaceful intercourse after the present European war is over, they cannot be blind to the fact that Australia will turn to this country for a large share of the commerce which was formerly carried on with Continental nations; and it will be the part of good business to encourage this trade in every possible way.

In general it may be said that Australians, New Zealanders and other residents of the South Pacific have a hearty liking for Americans; other things being equal, they are disposed to give us preference over any other nation outside of the British Empire or possibly its present allies. Our trade with the Australian continent, with New Zealand and with the islands under their control has already attained proportions second to that of Great Britain,

and it also has the advantage of being carried on through a large number of branch houses, agencies and special representatives familiar with the local conditions. Among these, any American manufacturer, who has not already made sales in the Australasian market, can readily find efficient representatives; and it is not at all difficult to inaugurate a trade which will be both profitable and enduring.

A Set of Error-Saving Production Forms

Five Blanks Typed at One Time Include Invoice, Acknowledgment of Order and Authority to Production Department

BY HORATIO S. MITCHELL

THE unusual feature of the set of forms shown herewith is the fifth and last copy.

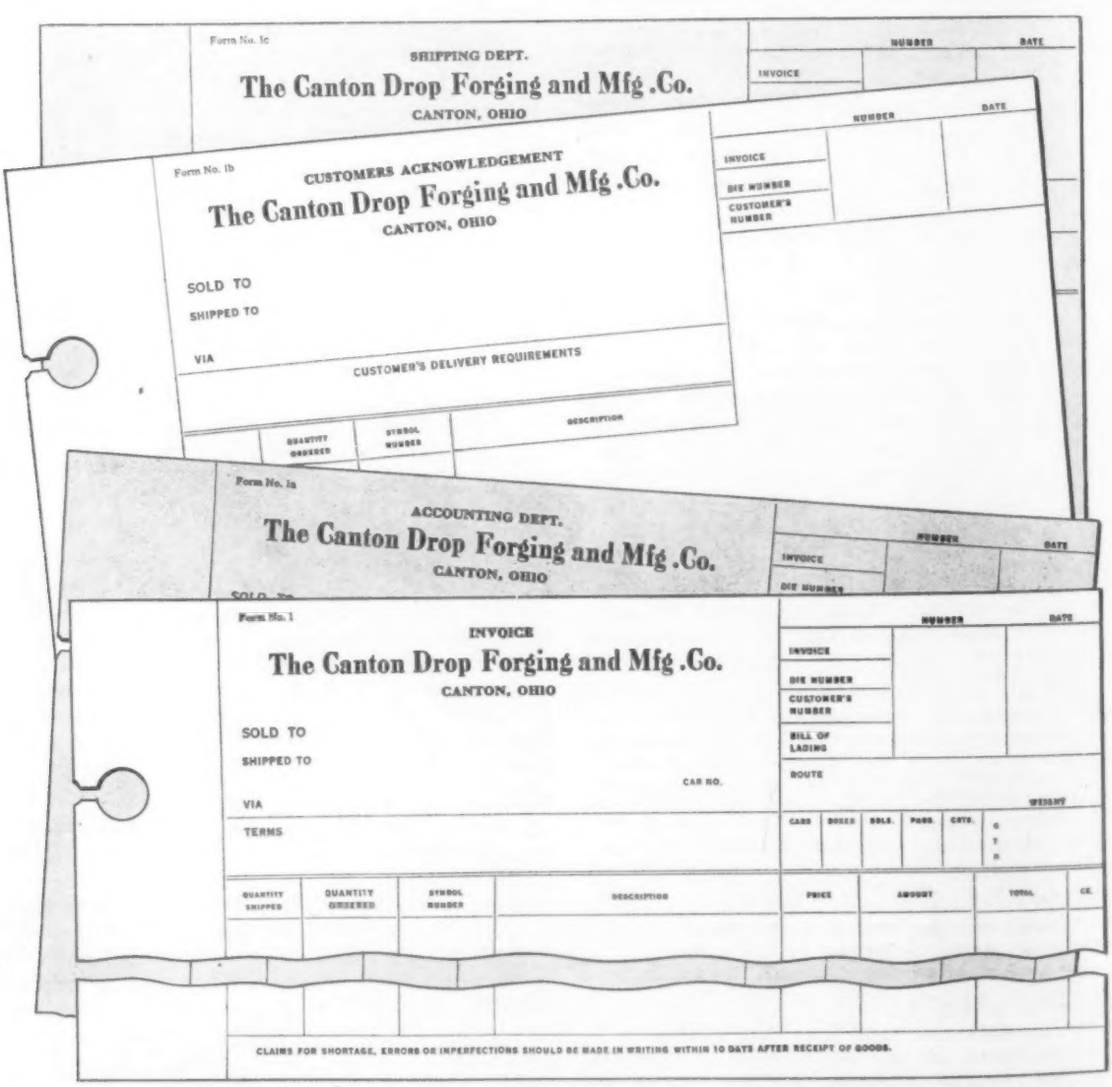
The first sheet of the set, and the second, are the outgoing invoice, and cashier's copy thereof, respectively. When an order for forgings is accepted, these two forms are filed vertically, by invoice number, to await the first shipment on that order.

The third sheet is mailed the customer, who is thereby furnished an exact copy of the order as the Canton Drop Forging & Mfg. Company, understands and accepts it.

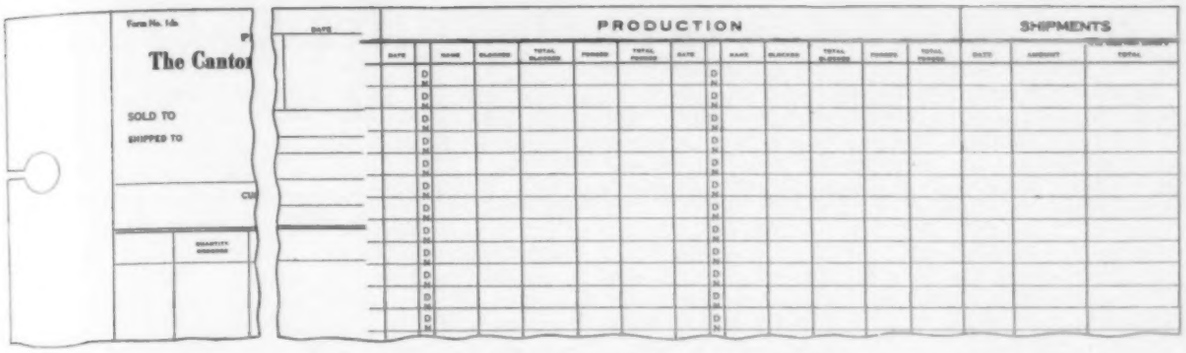
The fourth sheet is the shipping clerk's instructions, and authority to ship the forgings as they are delivered to him. He cannot ship anything without written authority, as embodied in one of these copies, and he enters his shipments upon this form, turning same over to billing department as fast as he fills out the bill of lading.

If the order is only partially filled by the first shipment, the shipping clerk receives his authority for future shipments upon much the same form, but printed on a different color paper and called a "back order." This, and the two invoices covering same, are also made at one and the same time, and show the quantity previously shipped, the balance due, as well as providing for the shipment that will be billed thereon.

The fifth copy is the production department's authority to place the work in the hammer. The



Four of the Five Forms Made Out at the One Time, Covering the Invoice and Also the Production Department's Authority



The Fifth Form Folds Double and Is Printed on Both Sides with the Same Blank Ruling. Spread out in the production department office, the production and shipping records are on the same sheet with the original copy of the order

printer pads this copy so that the half marked A receives the carbon impression of the order, when, and at the same time that the other four copies are written. Production and shipments are recorded upon the half marked B, after this form has been unfolded.

The value of this set of forms lies in the absence of any necessity for transferring the original order information except in the billing department, and there only when shipments are partial. The fifth copy, and the third as well, are only made out for the original order entry. Successive shipments are designated by retaining the original invoice number, but suffixing letters to each succeeding shipment.

Records are made upon copies of the customer's invoice, as he receives same. This makes reference easy all along the line, saves checking, and does away with the need of reference to original sources of information when orders are in process.

Meeting of Iron and Steel Electrical Engineers

Central station power for steel mills, the operation of the Heroult electric furnace, the electric reversing blooming mill and portable electric tools in the iron and steel industry are among the subjects to be discussed at the coming annual meeting of the Association of Iron and Steel Electrical Engineers, to be held at the Hotel La Salle, Chicago, Sept. 18 to 22, inclusive. Following a business session on Monday morning, Sept. 18, there are to be afternoon and morning technical sessions and plant visitations as follows:

Sept. 18, 2 p. m.: "The Value of Records to an Operating Engineer," by Ray S. Huey and "Cost Versus Upkeep of Direct-Current Motors," by A. M. MacCutcheon.

Sept. 19, 9.30 a. m.: "Central Station Power for Steel Mills," by the Central Station Power Committee, and "Design of Structures for Steel Mills," by Charles A. Randorf. Arrangements have been made to visit the power stations of the Commonwealth Edison Company in the afternoon.

Sept. 20, 9.30 a. m. (joint session with American Institute of Electrical Engineers): "Underground Distribution Systems," by George J. Newton, and "The Unaflow Engine," by Prof. W. Trinks. 2 p. m.: "Steel Conductors for Transmission Lines," by H. B. Dwight, and "The Advantages of Modern Types of Direct-Current Machines," by David Hall. 7 p. m.: Annual banquet and ball.

Sept. 21, 9.30 a. m.: "Mechanical and Electrical Operation of the Heroult Electric Arc Furnace," by George W. Richardson, electrical superintendent American Bridge Company, Pencoyd, Pa., and "Operating Characteristics of an Electric Reversing Blooming Mill," by E. S. Jefferies. 2 p. m.: "Control of D-C and A-C Motors as Applied to Cranes," by Paul Caldwell, General Electric Company, Pittsburgh, and "Portable Electric Tools as Applied to the Iron and Steel Industry," by A. M. Andresen.

Sept. 22: Arrangements have been made to inspect the following steel plants: Illinois Steel Company at Gary and South Chicago; American Sheet & Tin Plate Company at Gary; Wisconsin Steel Company at South Chicago, and Inland Steel Company at Indiana Harbor.

Meeting of National Safety Council

The annual meeting of the National Safety Council will be held at the Hotel Statler, Detroit, Mich., Tuesday, Oct. 17, with the opening session at 10 a. m. The third annual report of the secretary, W. H. Cameron, which will be presented at that time, devotes itself in part to the record for the year 1915-16.

The council started work in October, 1913 with $1,400 and 40 members. At the end of June, 1914, there were 731 members and at the end of the second fiscal year 1211 members. The council gained 1102 new members this year, an increase of 91 per cent over last year's record, and the present membership is 2120, with over 10,000 representatives and 3,500,000 employees. The income from dues has been something over $46,000 for the year. Five service and bulletin board bulletins have been sent out regularly each week and in all the National Safety Council has distributed over 3,000,000 copies of over 270 different pieces of literature and bulletins.

At the last annual meeting of the Council in Philadelphia, some 1700 representatives attended, fifteen sections were organized and the publication of the separate reports of the sectional meetings as well as of the congress itself required a book of 771 pages. Twenty local councils have conducted regular meetings, safety rallies, inspection of plants, etc.

At the Detroit meeting 25 directors are to be elected to fill vacancies of an equal number at that time, and among the nominations for this office are the following:

C. L. Close, manager bureau of safety, sanitation and welfare, United States Steel Corporation, New York; J. B. Douglas, manager claim dept., United Gas Improvement Company, Philadelphia; F. L. Hoffman, statistician, Prudential Insurance Company, Newark; Melville W. Mix, president Dodge Mfg. Company, Mishawaka, Ind.; Arthur T. Morey, assistant to president Commonwealth Steel Company, Granite City, Ill.; L. R. Palmer, chief inspector, Department of Labor and Industry, State of Pennsylvania, Harrisburg; R. C. Richards, chairman, Central Safety Committee, Chicago & North Western Railway Company, Chicago; H. H. Robertson, president Asbestos Protected Metal Company, Pittsburgh; W. D. Ryan, general commissioner of labor, U. S. Bureau of Mines, Kansas City, Mo.; F. C. Schwedtman, manager foreign department, National City Bank, New York; Francis P. Sinn, superintendent of safety, New Jersey Zinc Company, Palmerton, Pa.; Edw. C. Spring, manager Lehigh Valley Transit Company, Allentown, Pa.; S. W. Tener, manager accident and pension department American Steel & Wire Company, Cleveland; Franklin H. Wentworth, secretary National Fire Protection Association, Boston; Arthur Williams, president American Museum of Safety, New York; J. M. Woltz, safety director, Youngstown Sheet & Tube Company, Youngstown, Ohio; Earl B. Morgan, safety engineer, the Norton Company, Worcester, Mass.

Meily furnace of the Lebanon Blast Furnace Company at Lebanon, Pa., was blown in Aug. 19 on foundry iron.

Evolution of American Open-Hearth Practice

Early Developments Recalled by a Leading Exponent of the Process — More Scrap To-day, But Less Dependence on Scrap Supply

BY H. H. CAMPBELL

IT was in 1857 that Siemens invented the regenerative furnace, but not until 1861 did he take out a patent for what we now know as the open hearth; and even then he did not see that a new problem had arisen and that his furnace had almost miraculously appeared just when it was needed, for the Bessemer process had just come into use and large quantities of steel scrap were being produced. Numerous attempts were made to "pile" and weld this scrap, just as always had been done with wrought iron, and schemes of this kind were quite common even in the early eighties; but the welding of Bessemer scrap at that time was out of the question, because practically all the output was rail steel, while a large proportion was in sizes too large to be made into any ordinary "bundle."

THE SIEMENS-MARTIN PROCESS

For a long time after the regenerative furnace had been in operation for heating purposes, it was not realized that steel scrap could be melted on an open hearth, and large piles of crop ends and defective blooms accumulated without any practicable method in sight for their utilization. But in 1864 two brothers named Martin operated a furnace at Sireuil in France and worked out the method which is so familiar to us to-day of melting pig iron and scrap together. They obtained patents a year later and so for a long time it was the general custom to speak of the Siemens-Martin or more briefly the S. M. process; but to-day we more commonly refer to it as the open-hearth.

These patents for many years were the subject of litigation in this country and it was not until after 1880 that the decision was finally given against the patentees. The American steel makers who contested the suit were upright and honorable men, who in private matters would not defraud anyone of his just dues; yet in this case they fought against what they knew was right. When a witness during the trial was asked a question, he did not give a simple, straightforward reply, but consulted with his attorney; and the answer was written out on paper, revised and re-revised so as to make it just as meaningless, ambiguous and misleading as possible, while local shop terms were used to puzzle the opposing experts.

By the private confessions of the steel makers the patentees had invented a new and valuable process and should have been paid a royalty, but these same men considered it their duty to their stockholders to contest the case. The final act of the drama was not staged until a few years ago, when, at an advanced age, Pierre Martin died in an obscure French village, where for many years he had lived in poverty. His last days were made comfortable by money raised by public subscription in Europe, not a dollar coming from America.

EARLY FURNACES IN THE UNITED STATES

The first open-hearth furnace in the United States was built at Trenton, N. J., in 1868, but its life was brief owing to faulty design. One was started at South Boston in 1870 and another at Nashua, N. H., in 1873. The Otis Steel Company in Cleveland was put in operation in 1874 and made a name for itself in the production of high-grade boiler steel. These furnaces as well as some others ran almost exclusively on low phosphorus stock, the pig iron coming either from Sweden or from the West Coast of England, and costing perhaps $30 per ton. To this was added either charcoal blooms that cost sometimes $65 per ton, or puddled wrought iron blooms made from selected low phosphorus pig iron.

In addition to these works using special melting stock, there were furnaces at Bessemer steel plants which were built to take care of the scrap that could not be used by the Bessemer; for the converting department had first claim on whatever material it could take. The operating cost might be higher in the furnace than in the Bessemer, but, after all, the final cost of the ingots was determined by the price paid for the scrap, and this was simply a matter of bookeeping; so that steel was made in these furnaces even when it cost more than the Bessemer product.

These plants were badly constructed and poorly equipped, because at first men did not appreciate the importance of big chambers and proper valves, while no one had yet dreamed of charging machines and electric cranes. At a plant where the writer was foreman in 1881 the furnaces had been planned to hold 5 tons, but later the hearths were enlarged to 10 tons without any change in ladle or regenerators, and then by keeping the lining thin the charge was increased to 15 tons.

The ladle stood on a truck which ran on a track and was moved by hand. Two nozzles were used, and pouring began when the ladle was about one-quarter full, the truck being moved twice and six ingots poured while the stream was still coming from the furnace. By this time the ladle was completely full of steel, making it necessary to knock a hole through the furnace runner to let the slag escape. If the tap hole were too big, the stream must be partially checked by a big plug which was always ready and often used, for otherwise the ladle would overflow; while if the least splash, even from a nozzle, got on the track, the ladle car could not be moved and it would take two or three days to clean up the mess that was bound to follow.

THE DUTIES OF A FOREMAN

So manifold were the dire possibilities that, acting under orders, the foreman came down to the works by night or by day, at least half an hour before the heat was ready, for it was his duty to set both stoppers, go through a rehearsal of the ladle operation to be sure everything was free in the driving gear, hold the bar that opened the tap hole and then jump down and act as tapper at the ladle. If everything went right he looked up to see if the wooden roof had caught fire and hoped for good luck next time. Perhaps it was 8 o'clock in the evening, when everybody else was at a party; but this foreman must go home and sleep, for there would be another heat at 4 o'clock in the morning and he

would be called out of bed an hour before and go back home at 5 o'clock, and get up again at 6, so that he could be at work when the whistle blew an hour later. For everybody from water boy to general manager was at work at 7 o'clock in the morning. This was the rule even in big cities like Pittsburgh half a century ago.

Such was the program for years, and operations went on continuously Saturday night and Sunday, and every day in the year. The writer received the royal salary of $70 a month, and could find not find fault, because his predecessor, who now occupies a high position in the steel world, had taken care of two furnaces which made together from four to six heats a day. We did not need to play golf in those days to get exercise.

The day laborers in the yard had their burden, for seven nights in the week they were called out of bed to help charge a furnace by hand, receiving 10 cents per hour for the most exhausting work that we know. This was before any immigrants had come from southern or eastern Europe, so that these men were all English speaking, while many were American born. It is well to put these facts on record, because we hear a good deal to-day about the exploitation of foreign laborers, who get twice as much as American workmen were paid before they came.

It may incidentally be remarked that just at this time the steel company paid a 75 per cent stock dividend. This was done in a way quite different from the custom nowadays, for the distribution was kept absolutely secret, and the facts only came to light a long time afterwards through a case in court over a contested will. But the foreman just mentioned did not get any of this dividend; so that, after all, things were just about the same then as they are to-day.

THE SUPPLY OF SCRAP

The normal output of finished material to-day is 76 per cent of the ingot weight; so, allowing for oxidation, the scrap output is about 20 per cent of the total steel made; and as the acid open-hearth furnace uses two tons of scrap for every ton of pig iron, it is plain that if all the scrap goes to the melting furnaces, the tonnage of open-hearth steel will be about 30 per cent of the total output. Yet we find that in 1880 the open-hearth steel production formed only 8 per cent of the steel tonnage, while in spite of a steady increase from year to year the proportion in 1890 was only 12 per cent.

This is easily explained, because for many years after the introduction of the Bessemer process into this country practically every pound of the product of the converters went into rails, and all the rail ends were used as vessel scrap, while a considerable portion of the blooming mill crops, as well as the scrap from the drop, was charged in the cupola, since all the iron was remelted. From this we see that an acid open-hearth plant 30 years ago was a sort of side show, which disposed of scrap that the more important Bessemer department found it inconvenient to use.

THE MARKET FOR OPEN-HEARTH STEEL

As before stated, there were open-hearth plants between 1873 and 1893 making low phosphorus metal which commanded a high price; but the melting furnaces at Bessemer steel works used ordinary stock and made very little soft steel, because they could hardly compete with the makers of wrought iron. A considerable business, however, developed in making high carbon steel, as it was found that the product of the melting furnaces was more uniform and more dependable than hard steel made in the converter from the same stock.

At many places the principal product was rail steel, and as late as 1884 a large open-hearth plant was built at one of our steel works where the arrangement of ladles and pit was designed on the assumption that rail and spring steel were to be made almost exclusively, as had been the rule for ten years before. Yet year by year the demand for soft steel increased as engineers demanded open-hearth plates and shapes for bridges; but the higher cost was a bar to its wider use, and until recently the Bessemer converter made most of our soft steel.

THE BASIC OPEN HEARTH

In 1879 experiments were made in Russia with a basic lining in an open-hearth furnace, and the results were published broadcast in metallurgical literature; so no patent right could even have been asked for. It is very doubtful if any claim would have been allowed, since the basic open-hearth process simply combined the well-known practice of the acid furnace and the recently invented basic lining for the converter.

The first experiments in the United States with a basic hearth were conducted at the Otis Steel Company's works in 1886, but it was two years later that regular and commercial operations were carried on at Homestead, while Steelton followed soon after; yet in 1890 the output of basic open-hearth steel was only 10,000 tons. From that time production rapidly increased, for by pure coincidence it happened that the Mesaba beds were opened in 1892 and the market was flooded with ore a little above the Bessemer limit in phosphorus, which was offered at a price which made it very attractive. Pure lump ore, which now cannot be bought in the open market, was also cheap, so that it was profitable to use the pig and ore process when scrap was not available.

INCREASED SCRAP SUPPLY

During the more than 20 years that have gone by since then, changes have been going on which have been slow and gradual, but they have tended to increase the open-hearth output by increasing the supply of scrap. The following are the most important of these changes:

1. The Bessemer plants which once used more than half the visible supply of scrap now absorb only a small fraction of it; because the converter to-day makes only one-quarter of our steel, instead of nearly all of it, as was the case a generation ago.

2. The iron blown in the Bessemer vessel is lower in silicon, as a rule, so that less vessel scrap is needed; while direct iron is used so that very little scrap can be melted in Bessemer cupolas.

3. Large quantities of old scrap are constantly coming back to the melting furnaces, whereas in the early days all wornout material was wrought iron.

4. The basic furnace requires less scrap for a ton of steel than the acid hearth, since a larger proportion of pig iron is charged; while the duplex process has put an end to all calculations about available scrap, since it produces more than it consumes.

5. This independence of the scrap supply has made possible the building of large, perfectly equipped open-hearth plants, where steel can be made as cheap as in the converter, and this decrease in cost, coupled with the superior quality of basic open-hearth steel, has pushed the Bessemer vessel into second place.

In Germany a little over 40 per cent of all the steel is made in open-hearth furnaces, and in France

about 30 per cent, which is what we would expect if all the scrap goes to the melting furnaces. In Belgium for many years the product of the open-hearth furnaces has been less than 8 per cent of the total production, so that much scrap must either be exported or used in Bessemer cupolas. In these three countries the basic furnace is used almost exclusively.

In Great Britain in 1915 the acid furnace made 49 per cent of all the steel produced, the basic hearth making 35 per cent. In the United States the acid furnace has been pushed into the background and in 1915 it made only 4 per cent of our tonnage. We have given ourselves over to the basic furnace, which last year made 69 per cent of all our steel, with prospects of a still greater proportion in the future, owing to the development of the duplex process. Taking the records for the whole world for 1913, which was the last normal year, we find that 60 per cent of all the steel coming from open-hearth furnaces was basic, and the proportion is increasing every year.

French Specifications for Shell Steel

Physical Tests and Corresponding Chemical Composition Required Under Recent Purchases —What Must Be Followed in the Mills

THE specifications covering purchases recently made, and yet to be closed, of round shell steel and round-cornered billets for the shells of the largest diameters for the French Government, are substantially in full as follows:

The bars are to be of rolled or forged steel of the best quality and manufactured by the "acid, basic open-hearth process or electric furnace process." homogeneous throughout, and free from seams, flaws, piping and porosity.

PHYSICAL TESTS FOR EACH HEAT

Four test bars shall be taken from a portion of the head end of the first bar of one ingot close to the discarded portion, or from a small ingot poured in the middle of the pouring, having such a section as to have the same reduction of area between ingot and test bars, as between the regular ingot and the bars contracted for. The test bars after forging, machining and heat treating are to be finished to the following measures: diameter, 13.8 mm. (0.543 in.); length between marks, 100 mm.

Said test bars are to be annealed, say heated to a temperature between 875 and 950 deg. C. for 20 min. and slowly cooled off in ashes or lime. Out of these four annealed bars, two are to be heated 20 min. at 825 to 875 deg. C., then quenched in water at 15 to 24 deg. C. (60 to 75 deg. Fahr.), and heated again 20 min. at 500 to 536 deg. C. in a bath of molten metal.

Such treatment will give two bars, *b*, annealed and two bars, *c*, temper-drawn after quenching. The bars *b* and the bars *c* to be treated for tensile results, as follows:

	Bars *b*	Bars *c*
Breaking load per sq. mm.	55 to 65 kg.	85 to 105 kg.
(Breaking load per sq. in., lb.	78,000 to 92,500	120,000 to 150,000)
Elongation, minimum on 100 mm.	18 per cent	9 per cent

Occasionally the inspector will take out of the finished material, two test bars, which will be treated as above and tested either in the plant, or in another place for verification, at the convenience of the inspector, it being understood that the ordinary variation between head and foot of ingot is to be allowed for.

CHEMICAL COMPOSITION

Chemical specifications are to be subordinated to physical tests, which are to govern. Inspectors are instructed to accept slight alterations to the subjoined requirements when physical tests and soundness of steel prove to be satisfactory. Composition of each heat is to be determined by analysis of a sample cast at about mid run. Apart from the iron, the following chemical elements may occur on the percentage shown.

	Min.	Max.
Carbon, per cent	0.30	...
Silicon, per cent	0.15	0.25 aiming to 0.18
Manganese, per cent	0.50	0.80
Phosphorus, per cent	0.03	0.08
Sulphur, per cent	...	0.05

DISCARD

The ingots must preferably be top-poured and a discard of 28 per cent off the top end and a discard of 4 per cent off the foot end of each ingot must be rejected. Such discards must be made after the ingots have been rolled into blooms or bars. Said minimum proportion of ingots, blooms or bars to be discarded is not allowed to be reduced without a written authorization from the head of the French Commission, and no reduction will be considered by him until the maker has given satisfactory proofs, through special inspection of the discards for at least fifty consecutive heats, made upon maker's application, that a new figure can be proposed. The new per cent of head discard which may be agreed upon by the head of the French Commission upon due reports of the inspection, will be thereafter a compulsory minimum for all the following heats of the same fabrication. The new per cent will not be in any case under 20 per cent, except when a special process of casting with sinkhead on inverted molds or similar is used.

In case the current fabrication should show that the adopted per cent of discard is not sufficient to remove practically all piping and porosity from the mill products, a new higher constant proportion of discard shall be adopted in order to obtain the result.

In order to ascertain whether the steel is free from piping, there will be left in the center of the section, between the discard and the utilisable part of the ingot, a core, which shall be broken cold in the presence of the inspectors. If the first discard is not sufficient, there will be made one or several others, under the same conditions, and until complete disappearance of the defects. This operation may be made at the choice of the contractor, either on the ingot, or on the bars rolled completely, or not, up to their final size.

For the large section bars (diameter of 200 mm. and upward) it may furthermore be exacted that the hot or cold sawing of each bar shall leave in the center of the section, a core to be fractured cold, in order to examine the grain of the metal and to make sure of the absence of any piping. This cold fracture is to be made in the presence of the inspectors. The inspectors shall also have at any time the right to have cold broken, for examination of each ingot, one bloom or one bar to be selected in any part of the ingot, and particularly when the ingots are bottom poured and likely to be spoiled by secondary piping. The Inspector shall in addition have the right to have, for each heat, a maximum number of eight parts of the bar acid pickled or etched to verify at sight the condition as to porosity and piping and as to surface defects.

CONDITION OF BARS

The bars are not to be submitted to any heat treatment; only the ordinary good straightening of bars on the cooling bed is called for. But they must be clean enough from scale after rolling so that the surface of the bars may be thoroughly inspected.

The area of the section of the ingot must be at least four times the area of the section of the finished bars, when the section of bars is under 9 sq. decimeters; and at least, three times, when section of finished bar is over 9 sq. decimeters (140 sq. in.)

REMOVAL OF SUPERFICIAL DEFECTS

Superficial defects as seams, folds, etc., are allowed to be chipped out by chiselling widened edges, the width of the chipping being at least 6 to 7 times the depth of the defect, and the bottom of the chipping being rounded under the following conditions:

Diameter of Round Bars, Mm.	Maximum Depth of Chipping Allowed, Mm.	No Chipping Necessary for, Mm.
82	4	1
90	4	1
105 and 110	5	1.5
136 and 160	7	2
225	8	2.25
278	9	2.5

Square Bars, Mm.	Maximum Depth of Chipping Allowed, Mm.		No Chipping Necessary for, Mm.
	On Flat Faces	Right on Corners	
105 and 110	3.5	6	1.5
145	5	8	2
200	9	12	2.25
250 and 265	10	15	2.5

It is understood that if the defect on the corner has a length greater than the diagonal it can be only chipped to the depth provided for flat faces. If the defect exceeds the above depth, the bar is to be rejected, or the defective part cut out, in accordance with the rule of specified lengths to be accepted, said rule being annexed to the contract.

PUNCH AND PAINT MARKING

The inspector will make a punch or stencil mark on every accepted bar. The maker will stamp every bar at one end with the heat number and the special mark of the works. On the other end, a mark of paint will be made, as directed by the inspector, with a color indicating the works and a form indicating one of the three classes of hardness to which the heat belongs.

INSPECTION

The mill shall take the necessary steps to give the inspector every facility for the inspection of the bars. Special arrangements must be made in view of the specified tests. A sufficient number of inspectors will be attached to the makers' works, in order that the inspection will not bring a costly delay to the shipment.

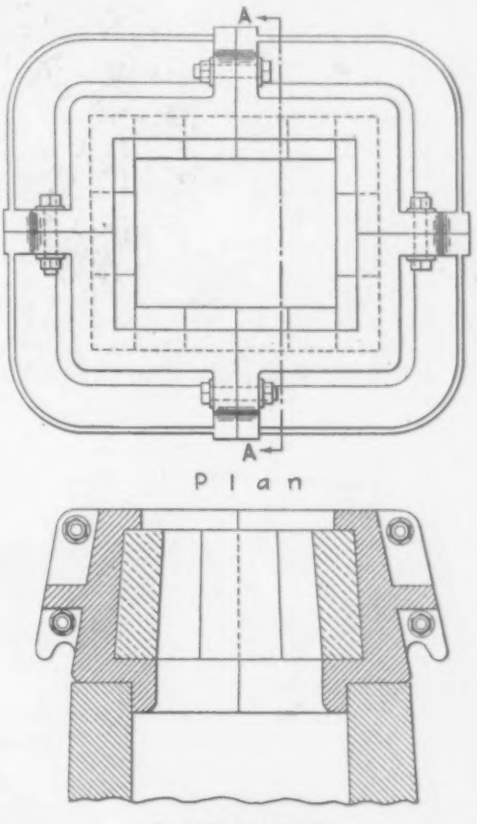
The maker shall, on the other hand, assist in the inspection of the bars, by presenting only bars selected by his own inspection after due chipping and repairs, and giving all necessary help for handling. Bars are to be left at the disposal of the inspectors 48 hr. if necessary. The maker is to advise the buyer a full fortnight in advance about the beginning of fabrication. He shall provide suitable desk and office for the inspectors and furnish them with a statement in duplicate, signed by the proper officer, of the physical tests and chemical analysis; a working diary concerning each heat, the total weight of the ingots, head discard and foot discard, number and weight of bars presented to inspection, and shipping documents.

The inspectors shall have at any time free entrance to parts of works where fabrication, testing and loading and shipment of steel bars are performed, and they shall be given the right to discard or reject any bars or heats which do not comply with the specifications.

Two electric annealing furnaces of the Baily type are in use at the Buffalo plant of the Otis Elevator Company for annealing steel castings. They are rectangular and a car with the castings piled on it is run into the furnace. Owing to the fact that no flow of air or gas through the furnace occurs, it takes but a short time for the confined air to become inert. The source of electric heat is made up of two troughs, one on each side and toward the top, of granulated graphite or carbon. The passage of the current gives rise to an innumerable number of miniature arcs and the heat is radiated to the arched roof of the furnace and thence to the castings.

A Hot Top for Ingot Molds

A hot top for ingot molds, which employs ordinary size firebricks, is in use at the plant of the Donner Steel Company, Buffalo, N. Y. It is the invention of C. E. Duncan, general superintendent of the company, and application has been made for a patent. Its simple construction is indicated in the accompanying drawings. Four corner castings are bolted together forming the cap, which rests on the top of the ingot mold. The cap is lined with the bricks, and an important feature is that no special shapes are required but regular commercial bricks suffice. The refractory and non-heat conducting property of the brickwork serves, of course,



Duncan Hot Top for Ingot Molds in Use at Plant of Donner Steel Company

to keep hot as long as possible the upper part of the freshly cast ingot, thus serving as a sink head and as a means for minimizing piping in the ingots. The experience at the Donner plant shows that it is efficacious in this regard. The head is readily removed, lugs projecting from the casting to allow use of crane hooks, and it is used over and over again until it becomes necessary to reline the top with fresh bricks.

The Determination of Aluminum as Oxide

Scientific paper No. 286 of the Bureau of Standards, entitled "The Determination of Aluminum as Oxide," gives the results of a research to define the conditions for the determination of aluminum. From observations made with a hydrogen electrode and with suitable indicators, the conditions for the quantitative precipitation of aluminum hydroxide by ammonium hydroxide were determined. In practice the completion of precipitation may be defined by means of methyl red or rosolic acid. The effect of various factors upon the precipitation, washing and ignition of the precipitate was determined. The procedure for obtaining accurate results is also described.

The Brown Instrument Company, Philadelphia, Pa., will open offices at 612 and 613 Chamber of Commerce Building, Detroit, Sept. 1, to be in charge of William Printz, formerly assistant sales manager.

Fig. 1—The Lower Crane Unloads the Cars and Fills the Charging Buckets. The upper crane takes the filled buckets to the charging platform, where they are dumped by means of the dumping racks at the left

Plant Improvements of Ashland Steel Works

Economies in Handling Raw and Finished Materials — Improvised Water Pumping Plant Accommodating Itself to Changing River Levels

THE Ashland Steel Company, Ashland, Ky., adopted some time ago an arrangement of its stock yard which enabled it to dispense with the services of about 20 laborers on each shift, as well as to effect other economies in the operation of the plant. Formerly the stock was loaded into buckets by hand, and these were then elevated to the charging platform of the furnaces by pneumatic hoists. The buckets were dumped by hand, requiring the services of two men on the charging platform. The new arrangement of the yard provided for the handling of material by traveling cranes and lifting magnets, and not only eliminated the greater part of the labor item, but also materially increased the speed of handling.

The stock yard is spanned by two 5-ton Morgan cranes, whose runways extend the entire length of the yard, a distance of 600 ft., and also span the railroad tracks on which the pig iron and scrap are brought into the plant. The cranes are fitted with lifting magnets for unloading the raw material and also for reloading it into the charging buckets. The charging buckets have a capacity of about 2500 lb. each, and whenever possible they are loaded directly from the cars, the rest of the carload going to the stock pile. At a higher level than the unloading cranes, and extending at right angles to them is a third 5-ton crane which serves as the charging crane. The charging buckets have lugs fitted to each side, which the crane operator swings against the dumping racks which may be seen in Fig. 1, about opposite the end of the runway of the lower level crane runway. By means of these racks he is enabled to dump the charging buckets entirely through manipulation of the crane. The charging crane is also used as a skull cracker.

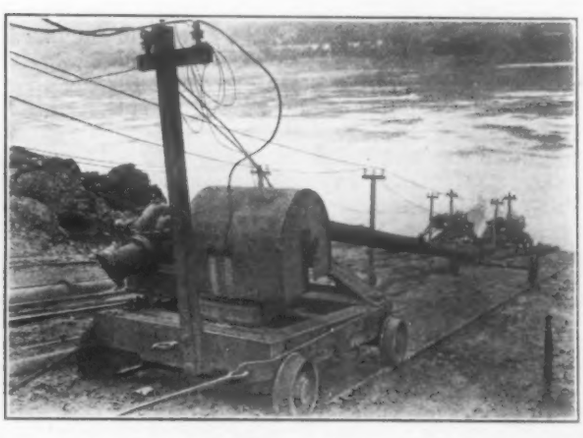


Fig. 2—The Centrifugal Pump with Flexible Wire Connections to the Direct-Connected Motor Can Be Raised and Lowered with the Rise and Fall of the River

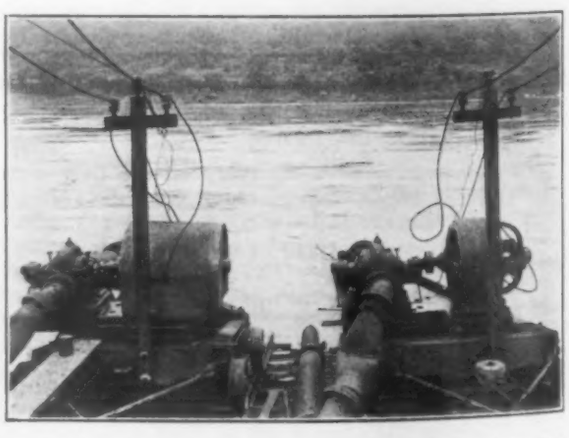


Fig. 3—A Short Length of Rubber Hose Connects the Delivery Outlet of the Pump with the Nearest Y-Connection in the Discharge Main

Another, though not uncommon, labor-saving arrangement, is illustrated in Fig. 4. Billets and slabs from the shears are discharged into buckets sunk in pits in the ground, the buckets when filled being removed by the crane. An arrangement of switches, which is clearly shown in the illustration, permits the slabs and billets to be diverted at will to either of the pits or to be continued along the table to another point of discharge. The sheared pieces are loaded directly from the buckets in the pits to the railroad cars for shipment, being cooled while in the pit.

Probably the most interesting change that has been made at the plant is the method of providing water for steam-making purposes. This is drawn from the Ohio River, which has a difference in level of about 60 ft. at high and low stages. If the pumps were situated above high water the lift would be too great for them at the extreme stages of low water, while if located at a point where they could draft water at the lowest stage they would be drowned at even moderate stages of high water. The problem was solved as shown in Figs. 2 and 3. Three Delaval centrifugal pumps, direct connected to electric motors were mounted on trucks, as shown. These trucks travel on tracks laid across the river bank, and are raised and lowered with the rise and fall of the water by means of electric winches. The suction pipe of each pump extends beyond the pump truck some distance, as shown, the end being carried on an auxiliary two-wheeled truck. Alongside the track for each pump is laid a discharge main, with Y connections set in at intervals. These Y connections are normally blank flanged, but the flanges are removed whenever it is desired to connect the main with the pump. A short section of rubber hose serves to make the connection between the discharge outlet of the pump and the nearby Y connection in the discharge main. This is shown in Fig. 3.

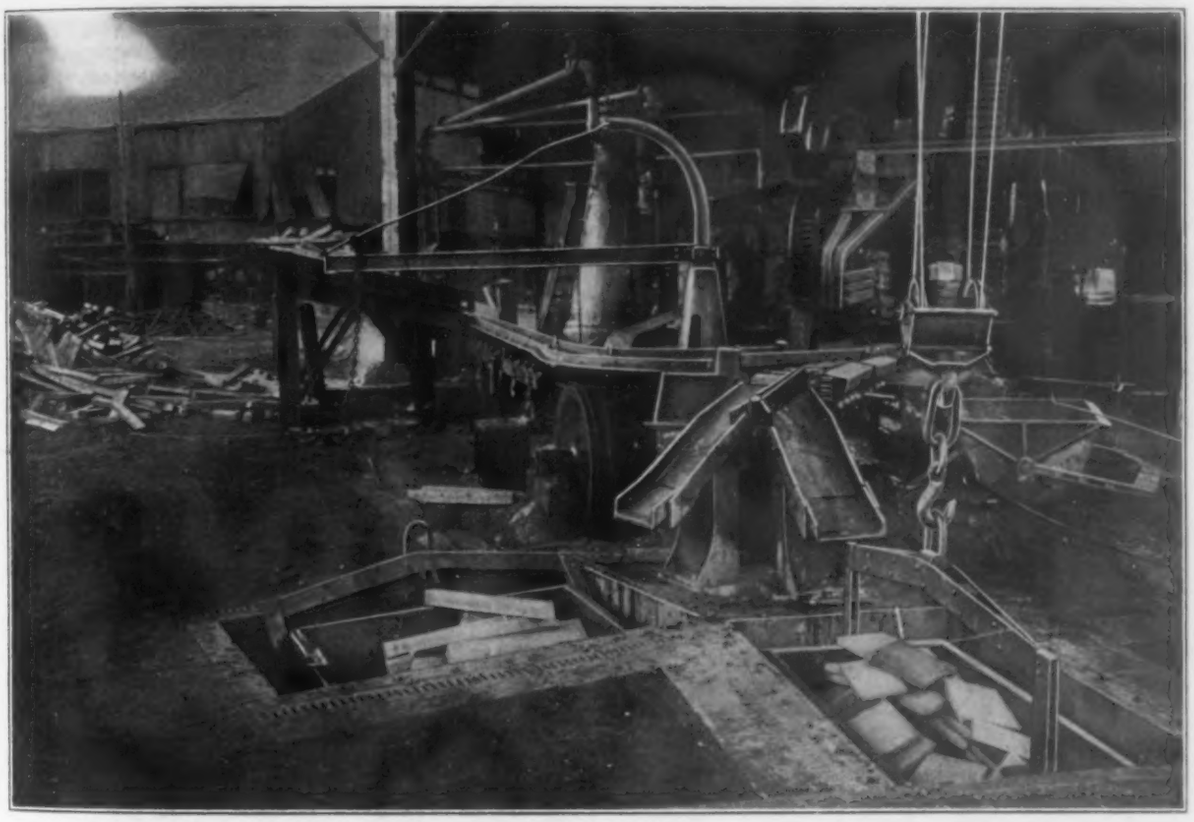


Fig. 4—Sheared Slabs and Billets from the Shears Are Collected and Cooled in the Buckets Before Being Transferred to Railroad Cars for Shipment. Switches on the chutes divert the sheared pieces as desired

More Time for Filing Patent Applications

WASHINGTON, D. C., Aug. 29, 1916.—A statute of importance to inventors and owners of patents has just been passed by Congress and approved by the President, extending temporarily the time for filing applications and fees and taking action in the United States Patent Office in favor of nations granting reciprocal rights to United States citizens.

Under the law heretofore in force an applicant for a United States patent, who had filed and obtained a patent in a foreign country, was required to make application here within 12 months of the date of the granting of such foreign rights on the penalty of losing his right to obtain a patent in this country. With the outbreak of the war the interruption of mail communication resulted in delays which prevented many persons, who had obtained foreign patents, from securing protection in this country and this condition has grown more acute with the passing of time. It is now estimated that a literal enforcement of the law heretofore in existence would destroy the American rights to thousands of important inventions patented abroad.

The statute just enacted provides that any applicant for letters patent or for the registration of any trademark, print or label, "if unable on account of the existing and continuing state of war to file any application or pay any official fee or take any required action within the period now limited by law," shall be granted an extension of nine months. Another provision of the act limits its operation to "citizens or subjects of countries which extend substantially similar privileges to the citizens of the United States, and no extension shall be granted under this act to the citizens or subjects of any country while said country is at war with the United States."

In order that the law may be retroactive as to cases of hardship that have arisen since the beginning of the war, it is provided that its terms shall be operative to relieve from default under existing law occurring since Aug. 1, 1914, and before Jan. 1, 1918, and all applications and letters patent and registrations in the filing or prosecution of which default has occurred are given the same force and effect as if timely action had been taken. W. L. C.

PURCHASING AGENT'S PLACE

His Important Responsibilities in the Modern Business Organization

Having had a very considerable experience as an iron and steel salesman, and later having had charge of purchases for important consumers of iron and steel, F. W. Rowe writes from an unusual acquaintance with both sides of the market in an article in the August *Purchasing Agent*. Mr. Rowe was connected with the sales department of the Bourne-Fuller Company, Cleveland, for sixteen years, then was appointed purchasing agent for the Aultman & Taylor Machinery Company, Mansfield, Ohio, manufacturer of water-tube boilers and threshing machinery, and from 1907 to 1914 was a buyer for the General Electric Company at Schenectady, N. Y. For the past two years he has been general purchasing agent of the H. W. Johns-Manville Company, New York, and he is chairman of the executive committee of the Purchasing Agents' Association of New York. His estimate of the purchasing agent's responsibilities and his place in modern business organization, as given in the article referred to, is as follows:

"I believe in the purchasing agent as an aggressive unit in an organization. The purchasing agent should work with the well-defined idea that he can make money for his company. While he should not be a gambler, he should be willing to back the opinions he forms by vigorous, well-supported recommendations to his superiors as to investment in material of good quality and of known continued use. He should make of himself something much more than a mere writer of orders for material that has been requisitioned. While always scrupulously fair, he still has play for strategy and diplomacy of high order.

"In the clerical division of his department he should not run to excessive system and detail, but he should have enough of these to tell him what prices have been, what he uses, and how much. The simplest system is the best; almost a skeleton system, provided at relatively short notice it can be made to produce essential facts.

"The purchasing agent for an industrial concern should, first of all, recognize the right and authority of the mechanical departments and engineering forces to specify the quality and characteristics required in raw material and supplies, and should never on his own volition depart from these specifications. However, there is still the opportunity for much conservative exploitation on the part of the purchasing department, meaning by this the constant search for approved safe substitutes for previously used material, but which may be bought at a lower price. Many surprising things happen when this idea is studiously followed, even though the new material may have to prove its case by the most drastic tests.

THE LOW PRICE FALLACY

"But, while always searching for less costly material, the purchasing agent should never allow his judgment to be clouded by the fallacy of low price. Poor raw material will bring to naught the best work that can be put on it, and will make a losing proposition out of the most skilled manufacture and salesmanship. Good buying is the getting of full value for expenditure related to the purpose to be served. The purchasing agent who has not a very good knowledge of the performance in service of the material he buys is blind. Intelligent decision on quality should precede judgment on price.

"In the operating department, the oil at 10 per cent less in first cost that requires 50 per cent more to lubricate; the belt at 20 per cent less that runs half as long; the coal at $5 less per car that burns out $150 worth of stokers and shuts down the boiler, are primitive examples of the fallacy of low price. They are obviously more than dear, and they lose money faster than bad debts. It takes good material to make good product; it takes good material to operate a plant economically. It is the purchasing agent who starts the process that ends with right quality goods in the hands of a satisfied customer.

"However, the purchasing agent who goes on the principle that he must pay the first price asked, and pay a good price to 'insure quality,' so that he may know that his material is the 'same as last,' is apt to fall a victim to his own trusting complacence. While his first obligation is to get the right material, he has an equal obligation to get it for the lowest price. Despite certain present manifestations in the business world, it will always be true that he who has anything to sell will get all he can for it, whether it be cheese or chisels.

"The one-time popular conception of the purchasing agent expressed by the adage, necessarily paraphrased, 'Once a purchasing agent always a "purchasing agent,"' does not, in justice, apply to the modern representative of the buying fraternity.

"The purchasing agent need not be a cold and haughty personage; on the contrary, he should cultivate human feeling and pleasant relationship. At the same time, the very nature of his position precludes for him special friendships in his business life. He must, perforce, keep such relations with others that no one has the right to expect specially favorable treatment. The grafter is gone, but even an undue amount of acceptance of the courtesies of business sets up obligation.

"The purchasing agent should remember that while he has a very important part of his company's success to answer for, he has by no means all of it, and it may be profitable at times to answer the call of reciprocity at some cost in the purchasing department to make it up in the whole business. This becomes a matter of proper discriminating judgment.

FOLLOWING A MARKET DOWN

"The peculiar part of the purchasing agent's job is that often his best work is done when he really does nothing; in other words, by knowing when not to buy. The purchasing agent who contracts just before a sharp advance is credited with having done a clever thing. Without detracting from this class of performance, it may require keener judgment and greater courage to refuse a considerable reduction in price because he believes that he may yet buy lower. The purchasing agent who can steadily follow a market down, and so time his purchases that his plant is always supplied with material, is doing the ablest work that falls to his lot.

"No doubt the purchasing agent wields considerable power. The argument of future business is a powerful one, but when he uses his power for the arbitrary, unjust settlement of controversies, rather than patiently arguing these on the merits of each case, he makes a mistake that will ultimately work to his disadvantage. Though he is powerful, he must still be fair. He needs the good will of the selling fraternity.

"The importance of the purchasing agent seems to be increasingly recognized. Of the triangle of expenditures that makes the cost of any product—namely, material, labor, overhead—he is responsible for that part which is the most susceptible to control through good judgment and selection. Very little bargaining can be done with labor. Overhead expense is apt to be set by conditions. Neither labor nor overhead can be bought on a low market for a profit, nor in any great degree bought on bad judgment in a high market for a loss; but material can.

"For every sale there is a purchase. If selling is important, why is not purchasing?"

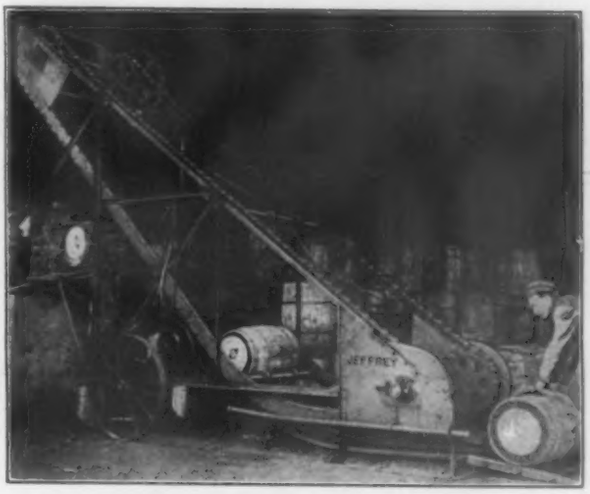
Workmen's compensation to be paid dependents of 290 workers killed in industrial accidents in Pennsylvania during the first six months of this year—the first the present act was in effect—aggregated $742,962.75. The total number of fatalities was 862, of which 157 occurred in the iron and steel trades. The total amount of compensation for all causes during this initial period is estimated at $1,500,000.

Portable Conveying Machines

A line of portable conveying and stacking machines has been developed by the Jeffrey Mfg. Company, Columbus, Ohio. They are designed to meet the requirements of practically all industries where bags, barrels, boxes and bales have to be handled and piled. Two styles of conveyors are built, one a portable arrangement, consisting of 20-ft. sections mounted on wheels, while the other, which is designed primarily for barrels, has two points of discharge, thus enabling it to be used for the delivery of barrels to the shipping platform or for stacking them in tiers, one upon the other.

In the portable conveyor for boxes, which is illustrated, the work is done by a belt 18 in. wide traveling at the rate of 125 ft. per minute. This conveyor has sprockets on the end shafts of each section to enable the adjacent one to be driven, all of the sprockets and chains being protected by guards. The conveyor rolls have flexible jointed bearings, and the channel stringers are mounted on ball-bearing casters, which are relied upon to make the sections readily portable. The driving motor is mounted either above or below the belt, and the driving section can be placed either at the ends or at any intermediate point. This conveyor has a total length of 140 ft., and will handle hourly 1500 packages weighing 80 lb. each, spaced at 5-ft. intervals on the belt.

The barrel conveyor is designed to engage the barrel after it enters the guideways, by cross bars and rollers. In this way, it is pointed out, the barrels are not dragged up the incline, but are rolled to the discharge points at heights of 5 and 8 ft. respectively above the ground, which permits the barrels to be placed on the shipping platform or stacked in tiers. This arrangement effects a considerable reduction in the amount of power required, as the friction of the cross bars is decreased by their rolling on the barrel. A 2-hp. motor drives the conveyor, which will handle 500-lb. barrels at the rate of 180 per hour. The entire mechanism is contained in a steel frame balanced on wheels 36 in. in diameter, and it is possible for one man to move the machine.



Another Form of Portable Conveyor Handling 500-Lb. Barrels at the Rate of One Every 20 Sec.

A stacking machine has been developed for handling miscellaneous freight on an apron 24 in. wide. This stacking machine will deliver to a greater height than the barrel-conveying machine illustrated, the delivery limits being 6 and 14½ ft. respectively. Bags and boxes weighing 340 lb. each can be handled, and it is stated that three men are required at the discharge end to prevent congestion.

Negotiations for the merger of the Railway Steel Spring Company with the American Locomotive Company are said to have taken tangible shape. The consolidation is a natural business evolution. The Baldwin Locomotive Works has plants manufacturing the products which the American Locomotive Company buys from the Railway Steel Spring Company. It was at first planned to incorporate a new company to take over the two. That proposal has been changed in favor of a plan for the sale of a controlling interest. Officers of the Spring Company deny the reports.

Conveyor for Industrial Plants Mounted on Wheels to Give Portability and Having an Arrangement for Coupling the Sections Together

THE GOVERNMENT ARMOR PLANT

Navy Department to Investigate Sites and to Consider Offers of Existing Plants

WASHINGTON, D. C., Aug. 29, 1916.—Pursuant to the provision of the naval appropriation bill authorizing the construction or purchase by the Government of an armor-plate factory, the Secretary of the Navy has issued the following notice to all parties who have communicated with the department with reference to a site for the proposed plant:

> The department will consider all proposed sites for the Government armor plant on Sept. 13 next. It would be glad, therefore, if you would submit a brief setting forth the claims for your proposed site in further detail should you care to do so.
>
> If you desire to present any proposition in person, a hearing will be given on that date, but a written brief for the consideration of the general board, which must, under the law, approve the location, must be filed.

The provision authorizing a Government factory was originally introduced in the Senate in the form of a special bill by Senator Tillman of South Carolina, chairman of the Committee on Naval Affairs. After the passage of this measure by the Senate, it was adopted by the House Naval Committee as an original provision of the naval bill and was finally enacted with minor modifications in the following form:

> The Secretary of the Navy is hereby authorized and directed to provide, either by the erection of a factory or by the purchase of a factory, or both, for the manufacture of armor for the vessels of the navy; said factory or factories to have an annual capacity of not less than 20,000 tons of armor; to be located at a place or places approved by the General Board of the Navy, with especial reference to considerations of safety in time of war; and the sum of $11,000,000 is hereby appropriated, out of any money in the Treasury not otherwise appropriated, to be immediately available, for the purposes of this paragraph. And if the United States owns no suitable site or sites, authority is hereby given to acquire by purchase, condemnation, or gift such site or sites as may be necessary. The expenditures for drafting, technical, expert, and clerical assistance necessary shall be paid from the appropriation herein made.
>
> The Secretary of the Navy shall keep accurate and itemized account of the cost per ton of the product of such factory or factories and report the same to Congress in his annual report.

While the notice promulgated by the Secretary of the Navy contemplates the receipt on Sept. 13 of nothing but proposals relating to sites for the projected factory, it is understood that in the meantime the corporations owning private armor factories will be advised that the department is prepared to consider offers to sell them to the Government in accordance with the provisions of the naval act permitting the acquisition or construction of a plant. It is appreciated, of course, that this opens up a wide field for speculation as to the outcome and as to the ramifications of any propositions looking to the purchase of an existing factory. The so-called experts of the Government have undoubtedly given but little attention to the serious technical problems involved not only in the making of armor but in the production of the steel necessary therefor. A strong point was made by the armor manufacturers during the last hearings before the Senate Naval Committee that the superiority of the armor now being supplied to American warships is largely due to the research and experimental work done on a large scale in all the departments of a vast and comprehensive steel works. It is a serious question whether it would be practicable to segregate any of the existing armor factories from the steel-making plants of which they are integral parts, and none of the Government's experts appears to have any very definite ideas as to what it would be necessary for the Government to acquire in order to secure a well-balanced plant, or whether the private manufacturers could dispose of all the necessary adjuncts without crippling their general steel-making plants. Presumably, these details will be threshed out in any conference that may result should the private manufacturers manifest a disposition to dispose of their armor-making facilities.

Among those who have been invited to attend the hearing at the Navy Department on Sept. 13 to urge the merits of building-sites for the proposed factory are nearly a score of representatives in Congress who are authors of bills authorizing the location of the Government factory at various places in the Congressional districts which they represent. Following is a summary of these measures:

H. R. 144, Representative Dale, New York; at or near navy yard at Brooklyn.

H. R. 520, Representative Bruckner, New York; in the Borough of Bronx, New York.

H. R. 660, Representative Vare, Pennsylvania; at Philadelphia navy yard.

H. R. 761, Representative Carlin, Virginia; in the city of Alexandria, Va.

H. R. 3609, Representative Edwards, Georgia; at or near Savannah, Ga.

H. R. 6859, Representative Neely, West Virginia; in or near the city of Wheeling.

H. R. 6860, Representative Neely, West Virginia; near the city of Moundsville, W. Va.

H. R. 8472, Representative Konop, Wisconsin; at or near Green Bay, Wis.

H. R. 8675, Representative Lieb, Indiana; in the city of Evansville, Ind.

H. R. 9543, Representative Cary, Wisconsin; at Milwaukee.

H. R. 9709, Representative Barkley, Kentucky; at or near Paducah, Ky.

H. R. 10,495, Representative Hollingsworth, Ohio; near Steubenville, Ohio.

H. R. 10,481, Representative Slemp, Virginia; at or near Roanoke, Pulaski or Bristol, Va.

H. R 12,033, Representative Flood, Virginia; at or near Glascow, Va.

It is understood that at the opening of the hearing on Sept. 13 a representative of the department will present briefly the considerations that will govern the selection of a site. In addition to the points that would appeal to private manufacturers with reference to convenient access to supplies of material, condition of local labor market, transportation facilities, etc., the Government will put special stress upon the practicability of protecting the proposed plant in time of war.

W. L. C.

Patterson Supply Company in New Quarters

The W. M. Patterson Supply Company, dealer in machinery and supplies, moved Aug. 28 into its new building on Rockwell Avenue, Cleveland, Ohio. The company now occupies a six-story and basement building, of reinforced concrete construction, which it erected specially to meet its requirements, and the new quarters are claimed to be among the best of the machinery display and storerooms to be found anywhere in the country. The floor space aggregates between 125,000 and 130,000 square feet and all modern facilities are provided for the display and handling of machinery and supplies. The first floor is taken up mostly with machinery and small tools. The entire second floor is used for office purposes, the basement for valves and fittings and the upper floors for the storage of machinery and supplies. The building is provided with a pneumatic system for the distribution of mail, an automatic telephone system and a pneumatic cleaning system. A blower system provides ventilation, washed air being circulated through the three lower floors and basement.

The St. Louis Chamber of Commerce, whose president is Clarence H. Howard of the Commonwealth Steel Company, has appropriated the necessary funds for a survey the purpose of which is to prepare data for a proposal to the War and Navy departments at Washington for the construction and equipment at St. Louis of a hydroelectric nitrate plant and an armor plate plant. The proposal involves the construction of a dam with accompanying locks for river traffic at a point just below St. Louis for the production of 400,000 hp. of electric current. The feasibility of such a plant has already been passed upon by engineers.

Lake Superior Corporation Earnings

The Lake Superior Corporation subsidiaries gave a very much better account of themselves during the year ended June 30, 1916, than in the previous 12 months. Their aggregate net earnings were $3,503,471, as compared with $1,366,210 in the previous fiscal year. The larger income, however, did not go to the parent company, but remains in the hands of subsidiaries in the form of enlarged reserves and balances. The parent corporation's income consisted of interest on bonds of subsidiaries amounting to $290,000 and other income of $45,795, making a total of $335,759, as against $369,032 in the previous year. The disbursements out of income were somewhat less, being $310,305, leaving a net of $25,454. This added to the balance from last year leaves a sum of $50,526, of which $40,000 was applied to reserve for depreciation of securities and the balance carried forward.

The disposition of the net earnings of all the subsidiaries, excluding the Algoma Central Railway, is as follows:

	1915	1916
Net earnings	$1,366,210	$3,503,471
Carried forward	61,930	*331,765
Deficit	331,765	.....
	$1,759,905	$3,171,706
Deductions:		
Interest, bond and other	$1,509,272	$1,513,539
Written off security expenses	62,000	206,680
Sinking fund	134,423	667,173
Reserves	54,209	425,595
Carried forward	.....	$358,718

*Deficit.

The Algoma Steel Corporation's production in each of the last three years, in gross tons, was as follows:

	1913–14	1914–15	1915–16
Pig iron	311,904	212,917	258,504
Steel rails	325,680	174,536	†215,416
Merchant steel	15,576	8,903	.....

†Includes rails, shell and merchant steel.

The capacity of the Algoma plant has been brought up to 40,000 tons per month. Construction is under way on two additional 75-ton open-hearth furnaces. Further improvements which the directors have in mind and which foreshadow new capital expenditure are the installation of a large structural mill, a plate mill and certain changes in the existing merchant mills, all of which will permit of the company's turning out a wide range of material. The last named changes are part of a policy of preparation for after-war business.

The directors intimate that in October the interest payments on the bonds and notes will be resumed. Of the latter the amount outstanding is $2,432,500, and they are due in March, 1917.

The water power which the company owned has been disposed of for $1,000,000, which sum is held by trustees and is available for new construction.

The Algoma Central Railway Company's report is not ready, but the directors understand that its earnings, particularly from the steamship line, show a substantial increase. Details as to the operation of the Algoma Eastern line are not given, but, as in the case of the Central, the earnings show an increase. More rolling stock has been acquired, necessitated through prospective additional traffic. Patents have been acquired for 700,000 acres of land, much of which carries valuable pulpwood and is favorably situated for getting it out.

German Steel Output Still Increasing

The German steel production in May, according to the Association of Iron and Steel Producers, was 1,412,137 metric tons against 1,202,598 tons in April. The May output is the largest for the war, and the daily output of 52,301 tons also exceeds the previous record of 52,286 tons per day in April. The May output was made up of 701,099 tons of Bessemer steel; 591,072 tons of open-hearth steel; 96,628 tons of steel castings; 9356 tons of crucible steel and 14,082 tons of electric steel. The output of steel castings is unusually large, and the electric steel production equals the recent high average.

Open-Throat Machine for Breaking Rails

A rail breaking machine having an open throat and designed for handling rails not exceeding 100 lb. per yard in weight has been brought out by the Covington Machine Company, Covington, Va. It is designed as a substitute for a closed machine similar to a guillotine frame shearing machine. As the machine is designed to break the rail with a single stroke of the plunger, the shock is somewhat severe and special attention was paid to the size of the main bearings for the eccentric shaft on that account. A cast steel block is used to support the bearing parallels, which is relied upon to save the main frame from gradual deterioration.

A steel head is mounted on the plunger and on the lower portion of the jaw two renewable bearing parallels are mounted in a cast steel block pivoted to the lower face of the machine jaw. This arrangement, it is

Machine with Open Throat Developed for Breaking Rails Weighing as Much as 100 Lb. per Yard

pointed out, has been employed to reduce the wear on the main frame, it having been found that the bearing parallels wear out rapidly and when mounted directly on the jaw or main casting gradually break down the corners and the surface to which they are fastened. The rail is broken by laying it with the side of the bulb and thin edge of the flange on the parallels and a steel fuller block on the end of a metal handle is placed between the rail and the plunger head by the operator.

The machine is belt driven to prevent the plunger head jamming through carelessness to such an extent that the machine stops instantly and cannot make the remainder of the stroke without damaging some part. While electric motor drive with some type of friction mechanism can be employed, this arrangement is not recommended by the builder.

The main eccentric bearings have readily removable bushings and the eccentric shaft bearing in the cover has been made very large. Heavy lugs at the top of the frame are relied upon to keep this bearing in alignment. The bearings of the driving shaft are of the ordinary babbitt construction with caps and bolts.

The new blooming mill of the Worth Brothers Company, Coatesville, Pa., which has been in course of construction for several months, has been started and is now running double turn making blooms for the forging department. This department, however, cannot use the entire output of the mill, and after a stock of blooms has accumulated, the mill will be used to manufacture slabs for the plate mills.

The Chattanooga Iron Works and the Eureka Supply Company of Chattanooga, Tenn., have consolidated under the name of the Chattanooga Iron Works.

Provisions of a Record-Breaking Navy Bill

Much Early Work, Taking in Four Battleships, Four Cruisers and Twenty Destroyers, May Go to Private Yards

WASHINGTON, D. C., Aug. 29, 1916.—The House conferees on the record-breaking naval appropriation bill have unconditionally surrendered to the Senate. The measure, as just passed, carries the full program of the Administration, not only with respect to the number of vessels, the construction of which is to be begun in the current fiscal year, but also as to the comprehensive three-year program designed to put the United States in third, if not second, place among the maritime nations of the world before the end of 1920. The nation-wide demand for preparedness, naval as well as military, has aroused the Navy Department from its previous lethargy, and plans are now being rushed with all speed providing for the early letting of contracts for all the vessels to be begun prior to July 1 next.

THE PROGRAM OF THREE YEARS

The three-year program, together with the construction to be begun immediately, is set out in the bill, as finally passed, substantially as follows:

The President of the United States is authorized to undertake prior to July 1, 1919, the construction of the vessels enumerated below:

Ten first-class battleships, carrying as heavy armor and as powerful armament as any vessels of their class, four of which at a cost, exclusive of armor and armament, not to exceed $11,500,000 each, to be begun as soon as practicable.

Six battle cruisers, carrying suitable armor and as powerful armament as any vessels of their class, four of which costing, exclusive of armor and armament, not to exceed $16,500,000 each, to be begun as soon as practicable.

Ten scout cruisers, carrying suitable protection and armament and having the highest practicable speed and greatest desirable radius of action, of which four, costing exclusive of armor and armament, not to exceed $5,000,000 each, are to be begun as soon as practicable.

Fifty torpedo-boat destroyers of highest speed and greatest radius of action, of which 20, costing not to exceed $1,200,000 each, are to be begun as soon as practicable; provided that not less than four of these shall be built on the Pacific coast if the cost of construction thereon does not exceed the cost on the Atlantic coast plus transportation from coast to coast.

Nine fleet submarines.

Fifty-eight coast submarines, of which three are to have a surface displacement of about 800 tons each, to cost, exclusive of armor and armament, not to exceed $1,200,000 each, and 27, which shall be the best and most desirable and useful type of submarine which can be procured at a cost, exclusive of armor and armament, not to exceed $700,000 each, shall be begun as soon as practicable, the sum of $8,217,000 being appropriated for the construction of such submarines, to be available until expended. Not less than 12 of these submarines to be begun immediately shall be built on the Pacific coast, subject to the conditions applicable to the torpedo-boat destroyers above set forth.

One submarine, equipped with the Neff system of submarine propulsion, exclusive of armor and armament, $250,000: Provided, that the owners of the Neff system of submarine propulsion will construct, in accordance with drawings, plans and specifications provided by them, one coast-defense submarine of about 150 tons displacement when submerged, carrying armor and armament similar and equal to that of the "C" class of submarines, with fittings, equipment, machinery, devices, appliances, and appurtenances of every kind with latest improvements, complete in all respects, and suitable for naval purposes: Provided further, that the money appropriated for this purpose shall not be paid to the builders of said boat until the same has been completed, passed satisfactory service tests, and been accepted by the Secretary of the Navy; but upon such completion, tests, and acceptance by the Secretary of the Navy the sum appropriated shall be paid.

Three fuel ships, one at a cost not to exceed $1,500,000, to be begun as soon as practicable.

One repair ship.

One transport.

One hospital ship, at a cost not to exceed $2,350,000, to be begun as soon as practicable.

Two destroyer tenders.

One fleet submarine tender.

Two ammunition ships, one at a cost, exclusive of armor and armament, not to exceed $2,350,000, to be begun as soon as practicable.

Two gunboats, one at a cost, exclusive of armor and armament, not to exceed $860,000, to be begun as soon as practicable: Provided, that the 66 vessels directed herein to be begun as soon as practicable shall be contracted for or shall be begun in navy yards within six months from the date of the approval of this act.

YET GOVERNMENT NAVY YARDS ARE FULL

As a check upon the private shipyards of the country, the bill provides that the Secretary of the Navy "shall build any of the vessels herein authorized in such navy yards as he may designate, should it reasonably appear that the persons, firms, or corporations, or the agents thereof, bidding for the construction of any of said vessels have entered into any combination, agreement, or understanding, the effect, object, or purpose of which is to deprive the Government of fair, open, and unrestricted competition in letting contracts for the construction of any of said vessels: Provided, that the Secretary of the Navy is hereby authorized to build any of the vessels herein authorized in such navy yards as he may designate."

The total amount carried by the bill, as passed, for the increase of the navy, representing vessels heretofore authorized and those authorized to be begun as soon as practicable, is $139,345,287, of which the sum of $72,749,787 is to be expended for construction and machinery, $47,110,000 for armor and armament, and $19,485,500 for ammunition.

APPROPRIATIONS FOR INEFFICIENCY

The extraordinary conditions under which work in the Government navy yards must now be carried on, owing to the demands of labor successfully urged by influential members of both Senate and House, are clearly reflected in the following provision of the naval bill, the avowed purpose of which is to expedite construction:

To provide for the speedy construction of the vessels herein authorized and for the additional cost incident thereto, including the employment of more than one shift of labor per day, overtime work, and the speedy delivery of material, the Secretary of the Navy in his discretion is hereby authorized to increase the total cost of each of said vessels, including armament, not to exceed 20 per centum thereof if any of said vessels be constructed in Government navy yards; and if any of said vessels or the armor or armament for same be constructed by private contract, the Secretary of the Navy in his discretion is hereby authorized to prescribe in the contracts for same provisions for the payment of premiums over and above the contract price, not to exceed 20 per centum thereof, for the most expeditious delivery of same, and further provisions for penalties for delays and failure to complete within the contract time: Provided, that if, in the judgment of the Secretary of the Navy, the most rapid and economical construction of the battle cruisers authorized herein can be obtained thereby, he may contract for the construction of any or all of them upon the basis of actual cost, plus a reasonable profit to be determined by him. That each and every employee of the navy yards, gun factories, naval stations, and arsenals of the United States Government is hereby granted 30 days' leave of absence each year, without forfeiture of pay during such leave: Provided further, that it shall be lawful to allow pro rata leave only to those serving 12 consecutive months or more: And provided further, that in all cases the heads of divisions shall have discretion as to the time when the leave can best be allowed: And provided further, that not more than 30 days' leave with pay shall be allowed any such employee in one year: And provided further, that this provision shall not be construed to deprive employees of any sick leave or legal holidays to which they may now be entitled under existing law.

The House and Senate conferees reached a compromise on the provision appropriating money to improve and equip certain navy yards for the construction of warships. As the House passed the bill, the expenditure of this money was conditioned upon the inability of the Secretary of the Navy to secure bids from private shipbuilders at fair and reasonable prices. As adopted by the conferees, the whole matter is left to the discretion of the Secretary, except that he is directed to equip certain yards regardless of bids received from private contractors. The text of this interesting provision is as follows:

The Secretary of the Navy is authorized to improve and equip the navy yards at Puget Sound, Philadelphia, Norfolk, New York, Boston, Portsmouth, Charleston and New Orleans for the construction of such ships herein or as may be hereafter authorized as may be assigned to such yards for construction, and the sum of $6,000,000, or so much thereof as may be necessary, is hereby appropriated for this purpose: Provided, that the navy yards at Puget Sound, Philadelphia, Norfolk and Boston shall be equipped for the construction of capital ships forthwith.

A PACIFIST SECTION

The bill, as it becomes a law, contains a declaration intended as a sop to the pacifists, asserting it to be the "policy of the United States to adjust and settle its international disputes through mediation or arbitration, to the end that war may be honorably avoided, and it looks with apprehension and disfavor upon a general increase of armament throughout the world, but it realizes that no single nation can disarm, and that without a common agreement upon the subject every considerable power must maintain a relative standing in military strength." In view of the premises, the President is authorized to invite at an appropriate time, not later than the close of the European war, all the great governments of the world to send representatives to a conference "which shall be charged with the duty of formulating a plan for a court of arbitration, or other tribunal, to which disputed questions between nations shall be referred for adjudication and peaceful settlement, and to consider the question of disarmament, and submit their recommendation to their respective governments for approval." The President is authorized to appoint nine citizens, who, in his judgment shall be especially qualified for such duty, to be representatives of the United States in the proposed conference. If at any time before the construction authorized by this act shall have been contracted for there shall have been established, with the co-operation of the United States, an international tribunal competent to secure peaceful determinations of international disputes, "and which shall render unnecessary the maintenance of competitive armaments," then such naval expenditures as may be inconsistent with the engagements made in the establishment of such tribunal may be suspended, when so ordered by the President of the United States.

ANTI-TRUST AND ANTI-EFFICIENCY PROVISIONS

The policy of the Navy Department with respect to the manufacture of material in Government plants, or its purchase from private contractors, is outlined by the bill as follows:

Of each of the sums appropriated by this act, except such amounts as may be required to meet obligations authorized in previous acts and for which contracts have been made, no part shall be used to procure through purchase or contract any vessels, armament, articles or materials which the navy yards, gun factories or other industrial plants operated by the Navy Department are equipped to supply, unless such Government plants are operated approximately at their full capacity for not less than one regular shift each working day, except when contract costs are less than costs in said Government plants, and except when said Government plants are unable to complete the work within the time required, and except in cases of emergency.

That no part of any sum herein appropriated shall be expended for the purchase of structural steel, ship plates, armor, armament or machinery from any persons, firms or corporations who are parties to any existing combination or conspiracy to monopolize the interstate or foreign commerce or trade of the United States, or the commerce or trade between the States and any Territory or the District of Columbia, in any of the articles aforesaid, and no purchase of structural steel, ship plates or machinery shall be made at a price in excess of a reasonable profit above the actual cost of manufacture. But this limitation shall in no case apply to any existing contract.

The text of the provision prohibiting scientific management in Government institutions, as finally agreed to, is as follows:

Provided, that no part of the appropriations made in this act shall be available for the salary or pay of any officer, manager, superintendent, foreman or other person having charge of the work of any employee of the United States Government while making or causing to be made with a stop watch or other time-measuring device a time study of any job of any such employee between the starting and completion thereof, or of the movements of any such employee while engaged upon such work; nor shall any part of the appropriations made in this act be available to pay any premium or bonus or cash reward to any employee in addition to his regular wages, except for suggestions resulting in improvements or economy in the operation of any Government plant.

THE FUTURE SUPERDREADNAUGHT

That the United States may keep abreast of the nations of the world in the construction of superdreadnaughts, the bill contains a provision directing the Secretary of the Navy to "submit to the Congress during its next regular session a report on the largest battleship which can be undertaken in the United States in the present state of the shipbuilding and engineering sciences and arts, giving due consideration to the present and prospective depths and other limiting dimensions of the docks and harbors of the United States and its possessions, and of the locks of the Panama Canal; and he shall further report the principal characteristics of such a vessel, giving the displacement, cost, number and size of guns, thickness of armor, speed and cruising radius; and he shall further report on the desirability of building one or more such vessels."

It is semi-officially announced that the Navy Department will undertake to have the eight capital ships included in this year's program constructed in private yards, and, with that object in view, bids will be solicited at an early date upon plans which are now practically completed. As to whether the construction of any of these eight vessels will actually be undertaken in Government navy yards will depend upon the view of the Secretary of the Navy as to the reasonableness of the bids submitted for these ships. W. L. C.

British Exports and American Guarantees

The following from the London *Iron and Coal Trades Review* is of importance to American firms receiving certain classes of supplies from Great Britain:

"The attention of the Board of Trade has been called by the Foreign Office to cases which have occurred in which British firms have consigned to one of his majesty's consular offices in the United States, on account of certain United States approved importers, materials in connection with which the importers are required to sign (and in the case of any previous shipments received have signed) guarantees before a British consular officer to the effect that they will take certain precautions to prevent the materials from reaching the enemy. On arrival of the particular shipments, however, the importers have in certain cases refused to sign the requisite guarantees, and the British exporters have been compelled to store the goods, with little prospect of selling them to other importers prepared to sign the guarantees.

"The Board of Trade desires to suggest that, with a view to obviating such difficulties, exporters of such materials should include in their contracts with United States importers a condition that the necessary guarantees will not be withheld in the case of any of the goods covered by the contracts."

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THE IRON AGE

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A Problem in Government

The country is now in a position to realize what our lawmakers have been doing in deferring so meekly to the wishes of the labor unions. The majesty of the people is offended in the condition presented in the railroad labor dispute. Here we have the spectacle of a comparatively limited number of men threatening to tie up practically the whole internal commerce of the United States to secure their selfish purposes. They demand greater compensation than they could earn in almost any other line of effort requiring the same or equal qualifications. Their demand is made on employers whose resources are limited by regulation and who are not free to transfer the burden of higher cost to the general public. The President realizes the gravity of the situation but uses the prestige of his high office in endeavoring to compel the railroads to yield to the men the most important part of their demand without arbitration. The country meanwhile is powerless to control the disturbers because of the following provision which was incorporated in the Clayton anti-trust act, adopted in October, 1914:

> Nothing contained in the anti-trust laws shall be construed to forbid the existence and operation of labor, agricultural or horticultural organizations, instituted for the purpose of mutual help, and not having capital stock or conducted for profit, or to forbid or restrain individual members of such organizations from lawfully carrying out the legitimate objects thereof; nor shall such organizations, or the members thereof, be held or construed to be illegal combinations or conspiracies in restraint of trade, under the anti-trust laws.

It is indeed galling to think that the people of this country have been placed by their chosen representatives in a position in which they are helpless and that they cannot legally attack the most gigantic conspiracy against their welfare that was ever hatched—and this, too, under the guise of improving the condition of the workingman. Our laws practically compel the prosecution of manufacturers, merchants or other business men who attempt to secure business benefits through combinations. They are obliged to avoid even the appearance of co-operation with one another. But labor organizations, on the contrary, which have in the case of the railroad unions grown so strong that they can control the trade of the entire country, are expressly exempt from the operations of the law.

The President has advised the railroad companies that unless the controversy can be adjusted he will resort to drastic measures. It would appear to be a most opportune time now for Congress itself to resort to drastic measures and take steps to destroy the power given to labor organizations by the passage of the Clayton anti-trust act. Its repeal would open the way for a case such as that now existing to be taken to the courts and summary punishment imposed upon those who would so seriously interfere with the business of the country.

Supply and Demand at Work

The materials committee of the National Implement and Vehicle Association, whose report on conditions in the steel-bar market and their effect on the implement trade was given in these columns last week, told the membership that the law of supply and demand was plainly operating in the steel market. There will be no dissent from that view; but the committee might have said also that the same law has determined the prices of steel products for a number of years, the chief difference in the present situation being that the price is high because demand is quite outstripping supply. The report referred to three interviews the committee had had with producers of steel, and of the failure of its efforts to get special concessions for the hundred or more manufacturers it represented. The arguments brought forward in these interviews are not detailed, but they have been made fairly familiar in the efforts that buyers of agricultural machinery and implements have put forth in the past three or four months to escape paying the more than 100 per cent advance in steel-bar prices over the basis of last year's contracts, or from 1.20c. to 2.50c.

Leaving out the history of the steel manufacturers' dealings with the implement trade, and the concessions of $2 a ton or more that have been enjoyed by the latter for years—saying nothing of the hard bargains driven at 85 and 90c. per 100 lb. for implement bars in periods of special distress in the steel industry—the argument in the recent campaign for a lower price turned on the certainty that farmers will get along with fewer new implements if the latter are advanced. Already some advances have been made, but on the higher bar prices that will apply on deliveries after Jan. 1

implements must go still higher. Total advances of 15 to 20 per cent, and in some cases more, are indicated, and the reduction in buying to be looked for is put at 25 per cent in some lines. There are implement manufacturers, it is to be said, who except to any such pessimistic view of their outlook, in spite of higher prices for materials and labor, though whether they count on some offsetting economies in manufacture or on an unprecedented willingness of the farmer to pay more for implements—as he ought, in view of his own war prosperity—does not appear. We have seen no reason to doubt that high-priced steel will cut down implement buying just as it has cut down railroad and structural buying. But in the one case, as in the others, it is as well to charge the damage, if that is what it is, to war prosperity and let it go at that.

Steel manufacturers may have argued rightly that there never was a good reason for the concessions to agricultural implement buyers, and that it is well that conditions have brought their elimination. Whatever may be said about the long cycle between the signing of bar contracts and the sale of the implement to the farmer, that is no better reason than the blast furnaceman could urge for a concession on his ore contract because it may be eighteen months before the last of the ore is charged into his furnace. The real reason why the concession has persisted is that the buyer of steel has had the whip hand most of the time—the same reason that has made contracts for finished steel the equivalent of buyers' options.

The implement makers' committee did not go into the legal phases of the issue, but it should be said that the question has been raised whether the steel manufacturers would not now lay themselves open to attention from the Federal Trade Commission if they formally agreed to give a preferential price to a certain class of buyers. Whatever the method by which implement bar buyers got the concessions heretofore—some more than others, because of large tonnages—in the present instance their effort has been co-operative. Whether there was any definite advice to implement association members from their officers or materials committee to refrain from buying bars until they were given a lower price does not appear. But it is pertinent to ask what view the Federal Trade Commission would take of an organized movement of consumers to affect a market price. That German buyers organized to break the price of American copper was urged by the Commission as one reason for allowing our manufacturers to combine in the handling of foreign markets. It would be interesting to have its suggestion as to the best method of dealing with a similar movement at home.

Immigrant Cripples

Congress has it on its mind to put the literacy test for immigrants before the President again, following the veto of January, 1915. There is no occasion at this time to discuss the merits and demerits of that proposition. Its veto met with quite general commendation outside the circles of organized labor.

The question of restriction of immigration involves a much more important matter. The European war has already made hundreds of thousands of cripples and will make many more. The problem as to the education of immigrants has not changed. The conditions are, and will be, substantially the same as they have been in the past. The conditions as to physical ability have been altogether altered. The proportion of cripples in the belligerent countries has been vastly multiplied. The rules that have been in force as to the admission of aliens not up to the highest physical standard, while perhaps adequate to conditions prevailing in the past, may easily be found to be altogether inadequate to cope with the new conditions.

The rule, as embodied in section 2 of the present immigration law, provides for the exclusion of "persons likely to become a public charge" and persons "who are found to be and are certified by the examining surgeon as being mentally or physically defective, such mental or physical defect being of a nature which may affect the ability of such alien to earn a living." The phrase "to earn a living" is subject to widely variant interpretations. In practice the uncertainties may have been slight in the past but for the future the case is entirely different. Congress fears a "flood of immigration" after the war; and accepting for argument that such a thing is a distinct possibility, it is obvious that the tendency to migrate to the United States may be much greater on the part of cripples than on the part of illiterates.

Ability to earn a living involves two factors—ability to render certain service and demand for the rendering of that service. Ability to play the violin, and to do nothing else, represents ability to earn a living only if there is demand for an additional violinist, when there remain some who wish to hear the violin played. There are some who do not. Maurice Maeterlink described music as "a particularly disagreeable form of noise."

A one-armed man can earn a fair living, usually, as a watchman, but if the supply of one-armed men is suddenly multiplied the supply of jobs will not hold out. The standards hitherto used in judging whether an immigrant alien has a physical defect which may affect his ability to earn a living would not be adequate to the condition of the number of one-armed men applying for admission being enormously increased. The immigration officials would be confronted by a new condition entirely, and the new problem of the partly unfit is a much more important one than the old and unchanged problem of literacy.

We de not consider at this time the question whether or not the tendency to immigrate to the United States will be greater or less, after the war, than it has been hitherto. What is obvious is that with so large a proportion of the male population in the belligerent countries physically defective there will be a vastly greater tendency to migrate to the United States on the part of those not physically perfect than on the part of those who remain physically perfect. One may go farther, indeed, and consider that the foreign governments, looking to their industrial welfare, may restrict emigration in order to conserve what may be left of their labor supply, and may easily hit upon the expedient of making it easier for the defectives to leave the country than the physically perfect. There are cases in which it is better to await the condition before

acting, to attempt to cross the stream only when the stream has been reached; but as diplomacy goes it would be much better for the United States to take its action first. A lesson should be taken from the actions of the entente allies, who have been making arrangements for commercial warfare after the bloodshed is over, partly, it is very reasonable to suppose, because the making of such arrangements afterward would be very awkward.

The United States has needed immigrants all these years to help in building its railroads, tilling its soil and making its coke and steel. For such work it could use only the strongest and most fit physically. Vastly less has it mattered whether or not these workmen could read. At no time has the United States needed cripples or those in the least defective physically. If such men should not be wanted abroad they would not be wanted here. Under existing law there is no protection but the provision that an alien is not to be admitted if he has been "assisted by others to come," or if his passage has been paid by "any corporation, association, society, municipality or foreign government, either directly or indirectly." It would perhaps be quite easy for foreign governments to escape the provisions as thus formulated and yet in substance exert upon the undesirables the most cogent influence to migrate to the United States.

To this great problem Congress had much better address itself than to the little question of the literacy test, which after all would mean little in actual practice, as to immigration, but perhaps a great deal by way of ammunition for the stump speaker.

Automobile Exports

While considerable attention has been directed to our exports of automobiles since the war started, these exports are really not large by comparison with the extremely rapid growth of the production. The number of commercial and passenger vehicles exported has been as follows, by fiscal years:

1911	11,803	1914	29,090
1912	21,757	1915	37,876
1913	25,286	1916	77,496

Production in the past twelvemonth, the automobile year, has been in the neighborhood of 1,400,000, according to some estimates; but taking only 1,200,000 as the production in the period concurrent with the production of those exported in the fiscal year, the proportion would be only between 6 and 7 per cent. The exports, in point of numbers, were more than two and a half times as great as in the year just preceding the war. The value of the business showed a somewhat greater increase, as the average value per car increased. The number of motor trucks increased sharply, as in the past fiscal year there was a fair proportion, whereas prior to the war our exports were almost exclusively of passenger cars.

Manganese Ore at Crystal Falls, Michigan

Private parties, drilling for iron ore in the Crystal Falls district of Michigan recently, struck 5 ft. of manganese ore running up to 35 per cent manganese. It is believed the deposit is small, but additional drilling is now being carried on. One hole was put down 100 ft. away without encountering manganese.

CORRESPONDENCE

Oxygen Gas for Removing Furnace Salamanders

To the Editor: In the issue of THE IRON AGE of August 24 appears an article by David F. Baker entitled "Oxygen Gas in Blast-Furnace Operations." This use of oxygen has been applied at the works of the Bethlehem Steel Company for about two years, not only at the blast furnaces but lately in the open-hearth departments. We believe we have discovered a hitherto unknown use for oxygen gas which will solve the mystery of the blast-furnace salamander. The hearth lining of our D furnace (recently blown out) was so badly worn away that we could not secure anything like a fair foundation for the lining. After a week of little progress made in drilling for the dynamite charges, a successful attempt was made to use oxygen gas as follows:

A ring of fire-clay was built about the point on the salamander where the hole was to be burned. Red hot coke was placed on the spot and oxygen was applied by the customary method of a long pipe attachment. As the hole became deeper, iron and slag filled the hole but were removed easily by inserting a pipe connected to the high pressure air line. It was while doing this we discovered that the free air, accompanied by the oxygen blast, positively accelerated the deepening of the hole as well as cleaning it out.

While we are more than pleased with the results obtained by this use of oxygen, with additional improvement contemplated in the use of explosives, we expect to remove the salamander for our next lining without the hand drill and accompanying hard labor of days or weeks. As progress along this line will be welcomed by all blast-furnace men, we will keep you informed as to developments in the future.

CHAS. L. T. EDWARDS,
Assistant Superintendent Blast-Furnace Department.
South Bethlehem, Pa., August 25, 1916.

Cutting Cast Iron When Red Hot with an Ordinary Saw

To the Editor: A very interesting article by Otto Vogel appears in *Stahl und Eisen*. It was called out by the statement of Dr. Petersen, one of the editors of that journal, that at a red heat cast iron could be easily cut with an ordinary carpenter's saw. This caused Mr. Vogel to look up the references to the subject, the oldest of which was in the *Annales de Chimie*, Paris, 1812, Vol. 82. This article was followed by discussions in German periodicals in 1813, 1824 and 1825. A brief synopsis of each of these is given.

The iron should be preferably at a uniform cherry red, when it can be cut readily. Attention is also drawn to the fact that Sven Rinman, the father of Swedish iron and steel metallurgy, points out that cast iron can be readily filed with an ordinary wood rasp if it is at a dull red heat. This is in his treatise on iron, which was translated into German in 1814. G. B. W.

Aeroplane Exports Five Millions

Aeroplane exports for the fiscal year ended June 30, 1916, were 269, against 152 to June 30, 1915, and only 34 to June 30, 1914. The valuation of the exports of aeroplane parts for the fiscal year ended June 30, this year, was $4,843,610, but only $583,427 and $37,225 for the fiscal years of 1915 and 1914.

The Chicago & Northwestern Railroad Company is stated to be contemplating the construction of a third ore dock at Ashland, Wis., at a cost of $1,500,000, to be ready at the opening of navigation in 1917. The present docks are of the old type of construction, but the proposed new structure will be of concrete and steel.

THE WEEK'S LABOR TROUBLES

Labor Difficulties in New England Continue to Crop Out

Little change has occurred during the week in strike conditions in Bridgeport and New Haven, Conn., and Westfield and Greenfield, Mass. Some of the strikers at the Westfield Mfg. Company, Westfield, are reported to be leaving town, having secured positions elsewhere, and the union organizers are continuing their efforts to hold the men in line. Two union leaders are also active in Greenfield, where the strike at the plant of the F. E. Wells & Son Company remains unsettled. About 200 laborers went on strike at the factory of the Randolph-Clowes Mfg. Company, Waterbury, Conn., Aug. 21. It is reported that they are demanding a raise of 25c. a day and five minutes to "wash up." Owing to the trouble with the laborers the factory was closed the following day.

Apparently trouble is brewing at the Pittsfield, Mass., branch of the General Electric Company. Many of the workmen of the plant belong to various craft unions and these organizations are united into a metal trades council with a local headquarters. A union committee reports that it has tried in vain to get a hearing with General Manager Cummings C. Chesney to place before him demands for recognition of an employees' committee, an increase of 10 per cent in both hourly and piece work wages and the reinstatement of employees who were discharged during the period of organization. On Aug. 26 the general manager issued a statement to the employees that he would receive at his office any individual employee or a committee of employees, who have grievances to present, or suggestions to make, but he would not officially receive a committee representing any of the so-called national or international labor unions. He also stated that on Oct. 1 a 5 per cent increase of hourly and piece rates will go into effect and that prior to Oct. 1 the employees by vote may determine whether the week's work is to consist of 50 hr. or 52 hr.

The Molders' Strike at Detroit

Trouble between members of the International Iron Molders' Union and their employers at Detroit has not been entirely settled, although telegraphic advices under date of Aug. 28 state that the men in all but two plants, which are under police guard, have returned to work after a satisfactory adjustment of their grievances. According to A. E. Terry, assistant secretary of the Union Conference Board of Detroit and vicinity, the dissatisfaction of the men in the foundries was typical of conditions in many local plants. A demand for a 9-hr. day and increased scales of pay were the apparent reasons for the strike, but the real cause, according to the employers, was their reservation of the right to maintain "open shop." On Saturday, Aug. 19, a compromise was effected, by which shorter hours and the restoration of the union men who had been dropped for serving on strike committees to their former positions were agreed upon. On the following Monday the men returned to work. There was no serious violence of any kind during the strike, and the police, having arrested a few men at intervals, quickly released them in each instance. In the two plants in which the molders still refuse to accept the offers made repeatedly by employers, labor officials assert that the companies have failed to keep faith with the men. The leaders of the latter, who number less than 100, say they will continue the strike indefinitely, although the workmen of one plant have not been at work for five weeks and of the other have been out since last November. The stove molders are all at work again, having been out only a week. They were instructed to return by their union officials. The weather was so hot that they probably felt like taking a vacation.

An Encouraging Milwaukee Statement

A statement showing that striking machinists in the Milwaukee district are rapidly returning to work and indicating that the organized demand for an 8-hr. day, which came to a head with the first walk-out on July 18, is not a success, was issued Aug. 26 by the Milwaukee Metal Trades and Founders' Association. It says: "At the beginning of the strike 22 per cent of the men in the departments where walkouts were ordered remained at work. On Aug. 26, 60 per cent of the men in these departments were working. The figures show that just previous to the calling of the strike 6578 men were employed in the departments later affected. At the beginning 4231 went out from 24 shops, leaving 2347 men at work in these departments. Now more than 3848 men are working in these departments, showing that more than 1500 have returned during the six weeks of the strike. The chart we have kept shows that the percentage of the men at work has been growing rapidly during the last few weeks."

A Nashville Employer Makes a Voluntary Advance

The Nashville Machine Company, Nashville, Tenn., announced Aug. 21 that it had voluntarily adopted the 8-hr. day as the basis for its operations thereafter. The change affects machinists, armature winders, pipe fitters and electric wire men. The pay of the men, based on a 9-hr. day, remains the same, amounting to an advance of 12½ per cent.

Strike in a Horseshoe Factory

Three hundred employees of the Bryden Horseshoe Company, Catasauqua, Pa., went on a strike Aug. 26, demanding payment of their wages twice a month, Saturday afternoons off, pilers of billets to be paid by the company instead of by the heaters and rollers and reinstatement of a discharged employee.

The Dayton Strike Not Yet Settled

A report under date of Aug. 29 indicates little change in the strike situation at Dayton, Ohio. A few more men have struck, but the manufacturers report more than double their number of old employees have returned. New men are being employed, and at present only one shop is suffering any inconvenience.

Molders' Strike at Cleveland

The molders at the No. 2 plant of the Taylor & Boggis Foundry Company, Cleveland, struck last week and the entire plant is shut down, about 125 men being out of work. The strike was not a result of any dissatisfaction in regard to wages, but because of efforts to unionize the foundry. The company's No. 1 plant is not affected.

First Launching at Chester's Shipyard

The launching of the first vessel from the ways of the Chester Shipbuilding Company, Ltd., Chester, Pa., the old Roach yard, took place Saturday morning, Aug. 26, when the Malmanger was successfully placed in the water. The new ship is all steel, 401 ft. long, 54 ft. broad and 32 ft. 9 in. in depth, with a draft of 26 ft. and a carrying capacity of 8800 tons. It is to be propelled by Westinghouse geared turbine engines, with three Scotch boilers, developing 3000 hp. and driving the ship at a speed in excess of 10½ knots per hour. The Malmanger is one of 10 ships to be built by the company for Norwegian interests of the same design of cylindrical oil tankers, besides four freighters for American firms. Its cost is to be about $1,000,000.

The last launching in Chester was at the same yard, then the Roach shipyard, and took place June 12, 1907, when the majestic City of Savannah glided into the Delaware River. It was the last of 10 ships built by John B. Roach for the Ocean Steamship Company.

The Pennsylvania Shipbuilding Company's yard at Gloucester, N. J., is rapidly nearing completion, and it is planned to lay the first keel Sept. 1. Two buildings have been practically completed, and the contract has been let for a third. The company has contracts for six 7000-ton tankers and two 12,500-ton freighters, all for Norwegian buyers. All of the ships will be launched sideways, an innovation on the Atlantic coast. They are to be equipped with Curtiss turbines made by the General Electric Company, Schenectady, N. Y.

Production of Spelter, First Half 1916

Figures compiled by C. E. Siebenthal of the United States Geological Survey from reports submitted by all zinc smelters operating during the first six months of 1916 show that the production of spelter from domestic ore in that period was 267,696 net tons and from foreign ore 48,756 tons, a total production of 316,452 tons, compared with 272,987 tons for the last half of 1915 and 216,532 tons for the first half. The following details are taken from his report:

The stocks of spelter held at smelters on June 30, 1916, amounted to 23,817 net tons, against 14,253 tons at the beginning of the year and 5884 tons at the middle of 1915. This shows a gain over stocks at the close of the year, part of which was doubtless due to the accumulation of working stocks at new smelters which started during the period.

From the foregoing figures and the records of exports and imports by the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 229,086 net tons, which compares favorably with 203,588 tons for the last half of 1915 and 160,906 tons for the first half. This consumption was not altogether domestic, however, for it must include the zinc content of the exports of brass and brass articles, which were largely increased during the first half of the present year.

In addition to that produced from ore, 15,800 net tons of spelter was distilled or recovered electrochemically from zinc ashes, skimmings and drosses. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The total output of spelter from both ore and skimmings was therefore about 344,000 net tons, or at the rate of 688,000 tons a year.

The number of retorts at zinc smelters June 30, 1916, was 196,640, and 24,812 additional retorts were building or planned, a total of 221,452. Some of the smelters listed earlier in the year as planned were abandoned, and a number of other plants not listed never got beyond the promotion stage. On the other hand, work was begun on two smelters not listed.

On the basis that 156,568 retorts were already in existence at the beginning of 1916, that the 49,612 additional retorts then planned, and electrolytic plants aggregating 60,000 tons annual capacity, also then planned, were completed and that the smelters of secondary spelter kept their usual capacity, the United States, it was estimated in the spelter statement of April 4, would have the capacity at the close of 1916 to produce spelter at the rate of over 900,000 tons a year.

It need have occasioned no surprise that the production during the first half of 1916 failed to equal half the capacity indicated for 1917. There are evident reasons, of course, why it could not. During the half-year 25 per cent of the retorts on which the estimate of capacity was based were only under construction or planned; in fact, one-sixth of the 25 per cent had not been completed at the close of the half year. These could not contribute to the output. Also a very considerable number of retorts was engaged in redistilling spelter of ordinary grade to make it of high grade. These retorts not only did not add to the output of spelter, but they diminished it, because there was a loss of 7 to 10 per cent of zinc in the redistillation.

The Chamber of Commerce of Allentown, Pa., has made arrangements for an extensive campaign to revive interest in the city. Efforts will be made to encourage new industries in all lines, especially the metal industries, and arrangements are being made to give financial assistance to deserving enterprises.

Tin exports from the Federated Malay States in July are returned as 3499 tons, against 3544 tons and 4582 tons for July in 1915 and 1914 respectively. The total to Aug. 1, 1916, is given as 25,224 tons, against 26,862 tons to Aug. 1, 1915, and 29,484 tons to Aug. 1, 1914.

Seattle Industrial Fair

The Manufacturers' & Merchants' Industrial Fair, held in Seattle the week of Aug. 14 to 19, is reported by our correspondent to have achieved the greatest success of any such event ever observed in the State of Washington. The exhibition enjoyed gratifying popularity and, aside from the Seattle business men and merchants, approximately 1000 merchants from all parts of the State were in attendance. The 200 exhibits, including among them the widest variety of State products ever brought together at one time, and their artistic arrangement, made the fair a memorable event. It was the fourth annual event of its kind to be held in Seattle, was constructed on permanent lines, and practically all of the booths will remain as the all-the-year-round exhibit of the Manufacturers' Association and Exchange.

The meeting of the Northwest Merchants' Convention, held in Seattle simultaneously with the holding of the fair, gave the movement for Washington-made goods and the industrial progress of the State a tremendous impetus. Attendants in charge of the various booths maintained by the State manufacturers report a surprisingly large number of inquiries for details and prices on goods manufactured, while scores of merchants placed large orders for manufactured articles previously purchased in other sections of the country.

In conjunction with the fair, the merchants of Seattle co-operated by making window displays of Washington-made goods in their stores, and even assisting to the extent of filling up window space unoccupied. A majority of the exhibitors expressed the opinion that the new industrial spirit for which manufacturers of Washington have been hoping has at last arrived, and that the factories of the State will receive the home recognition needed to put their business on a stable foundation.

At the convention the following topics were discussed: "Accounting, Credits and Collections," by E. C. McReavy, Big Lake, Wash.; "The Retail Salesman," Theodore H. Bowden, First National Bank, Everett; "Co-operation Between Banker and Merchant," C. A. Giblin, Seattle; "Advantages of Community Co-operation," W. H. Paulhamus, Sumner; "University of Washington," E. E. Dahm, University of Washington. Other speakers were Wiley Hemphill, Hemphill Brothers, Inc., on "Selling Merchants at Retail"; J. Fred Braid, advertising manager, Seattle *Daily Times*, "Advertising That Pays"; C. G. Morse, merchandise manager, Fraser-Patterson Company, "The Good Buyer."

Governor Ernest Lister made the welcoming address, and called on the visitors to become acquainted personally with the jobbers of Seattle as well as the manufacturers. R. R. Fox, Simonds Mfg. Company, Seattle, president of the Northwest Merchants' Association, said: "The great advantage in holding an affair of this nature is in acquainting the public with the articles that are manufactured and produced in the State. It would be my suggestion that these same exhibitors continue to advertise these Washington-made products, to be sure that everyone who visited the exhibits will not forget the things they saw at the fair."

Constant entertainment was provided for the visitors, including programs of music, vaudeville, automobiling, receptions and sight-seeing trips through Seattle's various manufacturing establishments.

The fair was held on the second floor of the Stuart-Henry-White Building, where the permanent exhibits of the Manufacturers' Association are maintained.

In giving an order for 63 motorcycles the War Department specified that they should be equipped with Corbin-Brown speedometers, which are made by the Corbin Screw Corporation, New Britain, Conn. Years ago the instrument was tested by experts in the Government laboratories at Washington and found to be accurate under all conditions. The excessive heat to which speedometers are subjected along the Mexican border necessitates the use of an instrument that is absolutely immune to the influences of heat and cold. It is doubtless with this requirement in mind that the War Department selected the Corbin-Brown.

UNIONS MAY BE SUED

Though Unincorporated, They Are Liable as Associations Under the Anti-Trust Act

An important decision bearing on the responsibility of labor unions in connection with their efforts to prevent the operation of plants where employees are on strike was given by the United States Circuit Court of Appeals recently at St. Paul, Minn. The United States District Court, in the case of the Bache-Denman Coal Companies of Arkansas against the United Mine Workers of America, dismissed the suit for triple damages, amounting to over $1,250,000, on the ground that the complaint did not set forth a cause of action under the Sherman anti-trust law. The complaint was directed against the attempts of the miners' union to prevent the operation of open-shop mines. There were mobs, riots, and the burning of railroad cars, lawlessness reigning until the arrival of Federal troops. Meanwhile, the mines were practically wiped out of existence and forced into the hands of a receiver. The Circuit Court of Appeals reversed the decision in the District Court. It held that a labor union, though unincorporated, may be sued in its own name under the anti-trust law, the statute specifically saying that the words "person or persons" includes corporations and associations. The Court of Appeals thus overruled the finding of the District Court to the effect that as the local unions had not been shown to be organized under any particular law they could not be held liable.

The next question was whether a case had been made out under the anti-trust law where the defendants had not, by boycott or otherwise, interfered with sales, though they had made attacks which cut off output. The higher court held that any attempt to restrain interstate trade by interference with the production of articles for interstate trade is a violation of the Federal anti-trust law. The case is now remanded to the District Court, where the defendants will be required to go to trial.

British Imports of Manganese Ore

British imports of manganese ore in July were 33,817 gross tons, against 50,826 tons in June. The total imports to Aug. 1 were 259,309 tons, against 154,158 tons to Aug. 1, 1915. The monthly import rate to Aug. 1, this year, has been 37,044 tons, against 22,022 tons per month in the same period in 1915. The 1913 and 1914 rates were 39,953 tons and 50,098 tons respectively per month.

The Crocker-Wheeler Company, Ampere, N. J., announces that its San Francisco district office, of which W. K. Brown is manager, has been removed from the Crossley Building, 619 Mission Street, to the ground floor of 87 New Montgomery Street. A large assortment of motors, generators and transformers will be carried in stock for the convenience of Pacific coast buyers of electrical equipment.

Charles M. Terry, Inc., Australian exporting commission merchant, 23-25 Beaver Street, New York, is conducting a business established by Charles M. Terry, who withdrew Jan. 1, 1916, from R. W. Cameron & Co., of which firm he was resident partner in Australia for many years. The new company's Australian offices are at 115 Pitt Street, Sydney.

Lime manufactured and sold in the United States in 1915 amounted to 3,589,699 net tons, valued at $14,336,756, according to G. F. Loughlin of the U. S. Geological Survey. This was an increase of 208,771 tons, or 6 per cent, over that of 1914 and nearly equaled the record output of 3,595,300 tons in 1913.

Deliveries of the Austrian Steel Trust for the first half of 1916 were 444,814 metric tons, against 295,364 tons to July 1, 1915. Of this year's total, 301,365 tons were bar iron and shapes.

CONTENTS

Truing Devices for Grinding Wheels 441
British Iron-Ore Output in 1915 442
Punching Machine for Ends of Rails 443
American Glass Equal to the Famous Jena Glass 443
Australasian Trade with the United States 444
A Set of Error-Saving Production Forms 446
Meeting of Iron and Steel Electrical Engineers 447
Meeting of National Safety Council 447
Evolution of American Open-Hearth Practice 448
French Specifications for Shell Steel 450
A Hot Top for Ingot Molds 451
The Determination of Aluminum as Oxide 451
Plant Improvements of Ashland Steel Works 452
More Time for Filing Patent Applications 453
Purchasing Agent's Place 454
Portable Conveying Machines 455
The Government Armor Plant 456
Patterson Supply Company in New Quarters 456
Lake Superior Corporation Earnings 457
German Steel Output Still Increasing 457
Open-Throat Machine for Breaking Rails 457
Provisions of a Record-Breaking Navy Bill 458
British Exports and American Guarantees 459
A Problem in Government 460
Supply and Demand at Work 460
Immigrant Cripples 461
Automobile Exports 462
Manganese Ore at Crystal Falls, Michigan 462
Correspondence 462
Aeroplane Exports Five Millions 462
The Week's Labor Troubles 463
First Launching at Chester's Shipyard 463
Production of Spelter, First Half of 1916 464
Seattle Industrial Fair 464
Unions May Be Sued 465
British Imports of Manganese Ore 465
Old Machinery House Changes Its Name 465
Iron and Metal Markets 466
Iron and Industrial Stocks 476
Finished Iron and Steel Prices, Pittsburgh 477
Metal Markets 478
Orders for Locomotives 478
Large Sulphuric Acid Exports 478
Customs Decisions 479
Welding at the Electrical Exposition 479
Inland Steel Company Starts New Open-Hearth Furnaces 479
Personal 480
Heroult Furnace Installations 480
Britain's Great Increase in Munitions 481
American Porcelains 481
Manganese Ore and Ferromanganese Imports 481
Obituary 481
Navy Department Adopts Geared Turbines for Destroyers 481
Pittsburgh and Nearby Districts 482
Judicial Decisions 483
Machinery Markets and News of the Works 484
New Trade Publications 492

Old Machinery House Changes Its Name

The Prentiss Tool & Supply Company, 149 Broadway, New York, announces that on Sept. 1 its name will be changed by the formation of a new company, under the style of Henry Prentiss & Co., Inc. The new company will succeed to the business and properties of the one which has become so well known. Except for the change of name, the business will go on as heretofore, with the same officers, directors, stockholders, general organization and business policy. Henry Prentiss is president of the company and Marshall Prentiss is secretary and treasurer. It handles a line of metal-working machinery of high reputation, and has offices in Boston, Buffalo, Rochester, Scranton and Syracuse. Henry Prentiss was for some years vice-president of the National Supply & Machinery Dealers' Association, and in charge of the machine-tool interests of that body.

Iron and Steel Markets

GREAT PRESSURE ON MILLS

Large Orders, Foreign and Domestic

Rail Buying by France and England—Pig-Iron Market Broadening

The difficulties of the steel mills are again increasing, as the delivery of six months' output and more now narrows down for many of them to the four months that remain of 1916. Production in August was about equal to that of July, in spite of trying conditions, but new business was larger and the Steel Corporation expects to end the month with an increase in unfilled orders.

Domestic buying of finished steel for the first half of next year has not been conspicuous, though a good many implement makers have contracted for steel bars at 2.50c., the sales of the leading producer on this account being reported at 160,000 tons.

While mills are not disposed to put up prices on contract material, the market is stronger and premiums for early delivery are more in evidence, particularly on bars, plates and shapes. The Steel Corporation now quotes on forward delivery 2.60c., Pittsburgh, for bars, 2.70c. for shapes and 3c. for plates.

The 1916 naval program will make a far greater demand on steel works than had been calculated. It is now figured that hulls and armament 215,000 to 220,000 tons will be needed for the 4 battleships, 4 battleship cruisers, 4 scout cruisers, 20 destroyers, 20 submarines, 1 fuel ship, 1 ammunition ship and 1 hospital ship. In the case of two steel companies, at least, some of this Government work must be taken on to the exclusion of more remunerative foreign orders.

New vessel orders include three on the Pacific Coast, two at Philadelphia for American owners, and two at Baltimore for Norwegian interests. Steel placed for these is mainly for the third quarter of 1917. An Eastern yard has just placed 40,000 tons of shipbuilding steel, chiefly plates. Japan is still a buyer for its shipyards, and its wants make up the bulk of a 20,000-ton inquiry pending in the Chicago district.

Railroad wants have been more of a factor in the past week. The Southern Railway has ordered 20,000 tons of rails for next summer and 5000 tons has been bought for Cuba. The Canadian Northern is inquiring for 20,000 tons, of which it is likely only 10,000 tons can be supplied in this country. The Grand Trunk is in the market for 20,000 tons. In tie plates the Santa Fé order for nearly 10,000 tons is a feature.

France has just closed for 15,000 tons of rails, making its total orders in the past year about 100,000 tons. Great Britain, it now develops, has bought 56,000 tons of rails here, or much more than has been estimated. These export rail orders have given tonnage to Bessemer mills.

The placing of a large tonnage of 1½-in. and 2-in. Bessemer angles for France is attracting attention. Two steel companies have taken 18,000 tons, with 8,000 to 10,000 tons pending. Mills have asked 3.10 to 3.25c. on this material.

Foreign buyers for other than war needs are more active as signs point to the continuance of high prices instead of the reductions indicated two months ago. Wire products, structural shapes and plates are being extensively figured on. From Italy there is a 10,000-ton inquiry for sheet piling.

The scarcity of semi-finished steel is less acute in the Middle West, though one large steel company is still buying from others. On sheet bars it is indicated that one producer will ask $3 a ton more for fourth quarter than the basis of current deliveries.

The broadening of the pig-iron buying movement is evident, but there is considerable irregularity in prices. In view of the dip of the market in all districts in putting through the large transactions with which the August movement started, few sellers are now getting more than they were quoting through the lull. Close to $17.50 at Chicago district furnace was done on 2.25 silicon iron in the latest competition between Northern and Southern sellers.

Thus far, large buyers have taken the bulk of the iron sold for first half of next year. Buffalo reports sales of 100,000 tons of all grades in the week, most of it in good-sized lots. Some foundries will buy more iron for this year, but the large majority will carry over 1916 iron two or three months into 1917. Machine shop and foundry strikes have done much to keep pig iron from sharing in the advances in steel.

At Pittsburgh, the long predicted advance in basic pig iron is still delayed. A sale of 10,000 tons was made there, and inquiry covers 20,000 to 25,000 tons. An Indiana buyer has closed for 25,000 tons with Detroit furnaces. In eastern Pennsylvania, the basic market is higher; how much, will be shown by a new inquiry for 18,000 tons.

Pittsburgh

PITTSBURGH, PA., Aug. 29, 1916.

Prices of iron and steel products are fully as strong as at any time this year. They are much firmer than they were in June, when there was a decided lull and the market went off to some extent. The scarcity of Bessemer and open-hearth steel, which, however, promises to be corrected before long, is having the effect of holding prices on finished material very firm, the chances favoring further advances on some lines before long. The strength in prices on steel products was shown very clearly recently in the case of steel bars. Some implement makers that had the chance of covering their needs of steel bars for first half of 1917 at 2.35c., Pittsburgh, but refused to do so, claiming the price was too high, have since come in and bought at 2.50c. The market on Bessemer black sheets is stronger, due largely to the fact that sheet mills which buy their sheet bars will have to pay a higher price for fourth quarter bars than for third quarter. It is stated, but not confirmed, that sheet bars for fourth quarter from one large producer will be considerably above $40 at mill. It is claimed that it costs about $14 per ton or more to put bars into sheets, so that at 3c. at mill for No. 28 black sheets there would only be a fair profit.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

	Aug. 30, 1916.	Aug. 23, 1916.	July 26, 1916.	Aug. 25, 1915.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia	$19.50	$19.50	$19.75	$15.50
No. 2, Valley furnace	18.25	18.25	18.25	14.50
No. 2 Southern, Cin'ti	**16.90**	16.40	16.90	13.90
No. 2, Birmingham, Ala.	**14.00**	13.50	14.00	11.00
No. 2, furnace, Chicago*	18.00	18.00	19.00	13.50
Basic, del'd, eastern Pa.	**19.75**	19.00	19.00	15.50
Basic, Valley furnace	18.00	18.00	18.00	14.50
Bessemer, Pittsburgh	21.95	21.95	21.95	16.45
Malleable Bess., Ch'go*	19.00	19.00	19.50	13.50
Gray forge, Pittsburgh	18.70	18.70	18.70	14.45
L. S. charcoal, Chicago	19.75	19.75	19.75	16.25
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh	45.00	45.00	42.00	23.50
O.-h. billets, Pittsburgh	45.00	45.00	45.00	24.00
O.-h. sheet bars, P'gh	45.00	45.00	45.00	24.50
Forging billets, base, P'gh	69.00	69.00	69.00	29.00
O.-h. billets, Phila	**48.00**	46.00	45.00	32.00
Wire rods, Pittsburgh	55.00	55.00	55.00	28.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.47½	1.47½	1.47½	1.25
O.-h. rails, heavy, at mill	1.56½	1.56½	1.56½	1.34
Iron bars, Philadelphia	2.659	2.659	2.659	1.459
Iron bars, Pittsburgh	2.60	2.60	2.50	1.30
Iron bars, Chicago	2.35	2.35	2.35	1.25
Steel bars, Pittsburgh	2.60	2.60	2.50	1.30
Steel bars, New York	2.769	2.769	2.669	1.519
Tank plates, Pittsburgh	4.00	4.00	3.50	1.30
Tank plates, New York	4.169	4.169	3.669	1.469
Beams, etc., Pittsburgh	**2.60**	2.50	2.50	1.30
Beams, etc., New York	**2.769**	2.669	2.669	1.519
Skelp, grooved steel, P'gh	2.35	2.35	2.35	1.30
Skelp, sheared steel, P'gh	2.45	2.45	2.45	1.35
Steel hoops, Pittsburgh	3.00	3.00	2.75	1.35

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	Aug. 30, 1916.	Aug. 23, 1916.	July 26, 1916.	Aug. 25, 1915.
Sheets, Nails and Wire, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	2.90	2.90	2.90	1.90
Galv. sheets, No. 28, P'gh.	4.15	4.15	4.25	3.40
Wire nails, Pittsburgh	2.60	2.60	2.50	1.65
Cut nails, Pittsburgh	2.60	2.60	2.60	1.60
Fence wire, base, P'gh	2.55	2.55	2.45	1.50
Barb wire, galv., P'gh	3.45	3.45	3.35	2.40
Old Material, Per Gross Ton:				
Iron rails, Chicago	**18.75**	18.50	18.50	12.25
Iron rails, Philadelphia	20.00	20.00	20.00	17.00
Carwheels, Chicago	11.50	11.50	12.00	11.75
Carwheels, Philadelphia	15.50	15.50	15.50	13.50
Heavy steel scrap, P'gh	16.00	16.00	16.25	14.00
Heavy steel scrap, Phila	14.75	14.75	15.00	14.00
Heavy steel scrap, Ch'go	15.25	15.25	15.25	11.75
No. 1 cast, Pittsburgh	14.50	14.50	15.00	13.00
No. 1 cast, Philadelphia	16.00	16.00	16.00	13.50
No. 1 cast, Ch'go (net ton)	11.50	11.50	11.50	10.00
No. 1 RR. wrot, Phila	20.00	20.00	19.50	15.50
No. 1 RR. wrot, Ch'go, (net ton)	**15.50**	15.25	15.25	11.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$2.90**	$2.85	$2.75	$1.50
Furnace coke, future	2.50	2.50	2.50	1.75
Foundry coke, prompt	**3.50**	3.25	3.25	2.00
Foundry coke, future	3.50	3.50	3.50	2.25
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**27.50**	27.25	25.25	19.00
Electrolytic copper, N. Y.	**27.25**	26.87½	25.00	16.00
Spelter, St. Louis	8.75	9.50	10.25	12.25
Spelter, New York	9.00	9.75	10.50	12.50
Lead, St. Louis	6.50	6.50	6.00	4.35
Lead, New York	6.50	6.62½	6.20	4.50
Tin, New York	**39.25**	38.50	38.00	33.75
Antimony, Asiatic, N. Y.	13.50	13.50	13.50	28.50
Tin plate, 100-lb. box, P'gh	$5.75	$6.00	$6.00	$3.10

The pig-iron market is showing more strength, and an early advance in basic, and possibly on Bessemer, seems probable. On all lines of finished material, specifications are heavy, and there is a fair amount of new buying for first quarter and first half of 1917. Best grades of prompt furnace coke are scarce and prices are up. Scrap is quiet, prices on some grades being very weak.

Pig Iron.—The local market on both Bessemer and basic pig iron is stronger, but as yet prices have not advanced. A southern Ohio company, which bought a month ago a round tonnage of basic iron for its open-hearth steel works, has recently closed for 16,000 tons more, but none of this iron came from the valleys. The Carbon Steel Company of this city bought 10,000 tons of basic at about $18, Valley, the business being divided between a local furnace and an outside maker, which has a slightly lower rate to Pittsburgh than the Valley furnaces. A Youngstown interest is inquiring for 20,000 to 25,000 tons of basic, but has not yet closed. The supply of Bessemer and basic iron is limited, and with an active demand for the latter the price of $18 at furnace, which has ruled for several months, is likely to be higher in the near future. There is a fair inquiry for foundry iron for first quarter and first half of 1917, some furnaces asking as high as $19 for that delivery, but as yet this price has not been paid. We quote Bessemer iron at $21; basic, $18; gray forge, $17.75 to $18; malleable Bessemer, $18.50 to $19, and No. 2 foundry, $18.25 to $18.50, all at Valley furnace, the freight rate to the Pittsburgh and Cleveland districts being 95c. per gross ton.

Ferroalloys.—The local market on all kinds of ferroalloys is very dull and new inquiry is light. Domestic makers of ferromanganese are quoting lower prices, and for 80 per cent domestic, $165 or less would readily be done. It is not confirmed that the leading domestic producer of ferromanganese has been a seller in the open market. We quote 18 to 22 per cent spiegeleisen at $40 to $45, and 25 to 30 per cent, $55 to $65, at furnace. On 50 per cent ferrosilicon we quote $88 to $89 in lots up to 100 tons; over 100 tons, $87 to $88, and over 600 tons, $86 to $87, all per gross ton, f.o.b. Pittsburgh. We quote Bessemer ferrosilicon as follows: 9 per cent, $30; 10 per cent, $31; 11 per cent, $32; 12 per cent, $33; 13 per cent, $34.50; 14 per cent, $36.50; 15 per cent, $38.50, and 16 per cent, $41. Seven per cent silvery is $28.50; 8 per cent, $29; 9 per cent, $29.50; 10 per cent, $30; 11 per cent, $31, and 12 per cent, $32. These prices are f.o.b. furnace, Jackson or New Straitsville, Ohio, or Ashland, Ky., all having a freight rate of $2 per gross ton to Pittsburgh.

Billets and Sheet Bars.—There is still a scarcity in the supply of Bessemer and open-hearth steel, but the new demand is not so insistent, foreign inquiry having quieted down a good deal, and domestic consumers stating they are getting prompt deliveries from the mills. Prices vary considerably, depending on the kind of steel and how soon it is wanted. In a general way, soft Bessemer and open-hearth billets are quoted from $45 to $50 per ton, makers' mills, but it would be an extreme case that would cause the latter price to be paid. Several of the larger steel mills that are badly oversold are still buying in the open market. We quote soft Bessemer and open-hearth billets and sheet bars at $45, maker's mill, Pittsburgh or Youngstown. From dealers it might be possible to obtain steel at $1 to $2 per ton less for ordinary specifications and carbons. We quote forging billets at $69 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take $1 extra.

Structural Material.—The new inquiry is fair, but local fabricators are not bidding actively on large new work that is coming up, being sold up for four or five months. The American Bridge Company has taken about 250 tons of bridge work for the Baltimore & Ohio Railroad. We quote beams and channels up to 15-in. at 2.60c. at mill for such deliveries as the mill can make, while small lots from stock for prompt shipment bring 3c. to 3.25c., Pittsburgh.

Steel Rails.—Reports are that a very large export inquiry for 60-lb. rails, 100,000 tons or more, is in the market, but if this is true the inquiry has not yet come to the local mills. We note a sale of about 800 tons of 45-lb. rails at $37 at mill, equal to $38, Pittsburgh. The demand for light rails from the coal mining and lumber interests is active, but it is said competition from the rerolling rail mills is more severe than for a long time, and, as a result, they are getting most of such business that is being placed. We quote 25 to 45 lb. sections at $47; 16 and 20 lb., $48; 12 and 14 lb., $49; and 8 and 10 lb., $50, in carload lots, f.o.b. at mill, the usual extras being charged for less than carload lots. We quote standard section rails of Bessemer stock at 1.47½c., and of open hearth 1.56½c., Pittsburgh.

Plates.—One leading mill reports it can readily obtain 4.50c. for ¼ in. and heavier sheared plates, if it will guarantee delivery in 30 to 60 days. For shipment in two to four months, this same maker has sold quite heavily at 4c. at mill. Some inquiries for steel cars are coming out. The New York Central has placed 1000 steel underframe freight cars with the Standard Steel Car Company. The Kimberly-Clark Company, Neenah, Wis., is inquiring for 20 flat cars. The Pittsburgh & Lake Erie has ordered 10 locomotives from the American Locomotive Company. The minimum mill price on sheared plates is 3c. for delivery in first quarter and first half of 1917. We quote ¼ in. and heavier plates for shipment in two to four months, from 4c. to 4.50c., Pittsburgh.

Sheets.—It is said a leading steel interest has notified customers to whom it furnishes sheet bars that the price for fourth quarter delivery will be at least $3 per ton higher than for third quarter. Due to this fact, prices on Bessemer black sheets are firmer, two mills having recently advanced their minimum price to 3c. at mill. There is still some weakness in prices of galvanized sheets, because of the lower price of spelter. A sale is reported of 1000 tons of open-hearth blue annealed sheets for November and December delivery at 3.15c. at mill. The American Sheet & Tin Plate Company is operating this week to about 91 per cent of hot sheet mill capacity, but many of its mills are not operated more than four days a week. We quote No. 28 Bessemer and open-hearth black sheets at 2.90c. to 3c.; No. 28 galvanized, Bessemer, and open-hearth, 4.15c. to 4.25c.; Nos. 22 and 24 black plate, tin-mill sizes, H. R. & A., 2.90c.; Nos. 25, 26 and 27, 3c. to 3.10c.; No. 28, 3.10c. to 3.15c.; and No. 29, 3.20c. to 3.25c. These prices are for carloads and larger lots, f.o.b. mill, Pittsburgh.

Tin Plate.—The mills state that the pressure for deliveries from the canning interests is still very insistent and much beyond what they are able to supply. Some inquiry is in the market for the first half of 1917, but, beyond a few contracts taken for Pacific coast consumers, the mills are not likely to name a price for some time. The export inquiry is still quite heavy. To regular customers, mills are quoting tin plate from stock at $5.50, while production tin plate is quoted at $5.75 and up to $6 to the domestic trade. For export, $6 to $6.25 per base box is quoted. We quote 8-lb. coated ternes at $8.50 to $8.75 for 200 lb., and $8.75 to $9 for 214 lb., all f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—As yet none of the makers of cold-rolled strip steel has taken any contracts for delivery into 1917, but a meeting is to be held in this city Sept. 7, at which time it is possible makers may agree to open their books for such contracts. Nearly all large consumers are covered over the remainder of this year, and orders coming in now are from consumers who refused to contract ahead. We note one contract for 600 tons at $6, base, per 100 lb., another of 150 tons at $6.50 and one of 100 tons at $6.25, all f.o.b. at mill. Terms are 30 days net, less 2 per cent off for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Wire Rods.—Fairly large contracts have recently been closed with consumers for delivery through first quarter and, in a few cases, first half of 1917. Prices on these contracts depend largely on the class of products made by the buyers. Concerns making wire and wire nails could not pay above $50 for rods and market their products, while concerns making other products for which prices are high pay $55 and as high as $60. One contract for 500 tons of soft open-hearth rods, delivery over the next two or three months, was placed last week. We quote soft Bessemer, open-hearth and chain rods at $55 to $60 per ton, f.o.b. Pittsburgh, but to regular customers who buy in large quantities $50 per ton is being named.

Nuts and Bolts.—Makers state the recent advance of 5 per cent in nuts and bolts is holding firm. Most consumers are covered over the remainder of this year at lower prices and are specifying freely against contracts. Another advance in the price of steel bars is looked for soon, and if this is made the prices of nuts and bolts will likely advance again. Deliveries of steel bars to the mills are still very unsatisfactory, but it is believed will be better in September, as the hot weather will likely be over by that time. The export demand is fairly active. The discounts are as follows, delivered in lots of 300 lb. or more, where the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 50 and 5 per cent; small, cut thread, 40, 10 and 5 per cent; large, 35 and 5 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 50 and 10 per cent; small, cut thread, 50 per cent; large, 40 and 5 per cent.

Machine bolts, c. p. c. and t. nuts, small, 40 and 10 per cent; large, 35 per cent. Blank bolts, 40 and 5 per cent. Bolt ends, h. p. nuts, 40 and 5 per cent; with c. p. nuts, 35 per cent. Rough stud bolts, 15 per cent. Lag screws (cone or gimlet point), 50 and 5 per cent.

Forged set screws and tap bolts, 10 per cent. Cup and round point set screws, case hardened, 60 per cent. Square or hexagon head cap screws, 55 per cent. Flat, button, round or fillister head cap screws, 30 per cent.

Nuts, h. p. sq., tapped or blank, $2.70 off list; hex., $2.70 off. Nuts, c. p. c. and t. sq., tapped or blank, $2.40 off; hex., $2.80 off. Semi-finished hex. nuts, 60 and 5 per cent. Finished and case-hardened nuts, 60 and 5 per cent.

Rivets, 7/16 in. in diameter and smaller, 45, 10 and 5 per cent.

Rivets.—The new demand is not so active as it has been, but general conditions are good, makers being sold up for three or four months, while the output of rivets is held down by slow deliveries of steel bars from the mills. Foreign inquiry is heavy. One local maker is shipping two carloads of rivets to India. On current orders, makers are usually able to obtain full prices. Quotations, which are being shaded in some cases by jobbers, are as follows: Buttonhead structural rivets, ½ in. in diameter and larger, $4 per 100 lb., base, and conehead boiler rivets, same sizes, $4.10 per 100 lb., base, f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent for cash in 10 days.

Railroad Spikes.—The market is dull, no new inquiries being out, and specifications are quiet. None of the makers is running to more than about 50 per cent of capacity, if that much. Prices are not very firm and are as follows:

Standard railroad spikes, 4½ x 9/16 in. and larger, $2.65 to $2.75; railroad spikes, ½ and 7/16 in., $2.75 base; railroad spikes, ⅜ in. and 5/16 in., $3.05 base; boat spikes, $2.80 base, all per 100 lb., f.o.b. Pittsburgh.

Wire Products. — Specifications are now being received by several mills in the Pittsburgh district for contracts for about 44,000 tons of barb wire for Russia, taken some time ago. There is still quite a heavy foreign inquiry for barb and fence wire, but local mills have so much business booked ahead they do not bid on much of this work. Specifications against contracts for wire and wire nails placed prior to the advance of Aug. 7 are coming in freely. It is said that about all the low priced contracts on nails and wire have been cleaned up, and prices on shipments now going out on wire nails range from $2.45 up to $2.50. On current orders, none of the mills is shading $2.60 on nails and $2.65 for bright basic wire. Prices to the large trade, effective from Aug. 7, are as follows: Wire nails, $2.60, base, per keg; galvanized, 1 in. and longer, including large head barbed roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $2.65 per 100 lb.; annealed fence wire, 6 to 9, $2.55; galvanized wire, $3.25; galvanized barb wire and fence staples, $3.45; painted barb wire, $2.75; polished fence staples, $2.75; cement coated nails, $2.50, base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing remain at 61½ per cent off list for carload lots, 60½ per cent for 1000 rod lots and 59½ per cent for small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—The market on steel bars is very firm, none of the mills quoting less than 2.60c., and one mill that a month or more ago was actively seeking business for fairly prompt delivery is now quoting 2.75c. for shipment at its convenience. Large consumers of steel bars say that deliveries from the mills have been very bad for some time, this being due largely to the

hot weather and vacation period, but it is believed that early in September production will come up considerably. There are still large export inquiries for steel rounds coming to local mills, but not much of this business is being placed here. One leading mill has recently taken several large contracts for steel bars from implement makers at 2.50c. for delivery in first quarter and first half of 1917. The demand for iron bars is active and mills are sold up for several months. We quote merchant steel bars at 2.60c. at mill for delivery at convenience of the mill, which would be in last quarter of this year or first quarter of 1917, while for prompt shipment from warehouse 3c. to 3.10c. is quoted. We quote refined iron bars at 2.60c. to 2.70c., and railroad test bars, 2.70c. to 2.80c., f.o.b. Pittsburgh.

Shafting.—Nearly all consumers of shafting are covered over the remainder of this year, and in a few cases contracts are made running into the first half of 1917. One leading maker has not taken any contracts for delivery beyond this year, believing that prices for first half of 1917 may be higher than they are now. Specifications are coming in freely and small current orders for fairly prompt shipment are being placed at about 10 per cent, and in some cases 15 per cent off. We quote cold-rolled shafting at 20 to 15 per cent off in carload lots for delivery in last quarter of this year and first quarter of 1917, and 10 per cent off in less than carload lots, f.o.b. Pittsburgh, freight added to point of delivery.

Merchant Steel.—Some consumers whose products are sold largely to the railroads are trying to cover for their supply of merchant steel through all of 1917. As yet mills are not inclined to quote so far ahead, but, if they do, claim they will ask at least $10 per ton over present prices. Current demand is active and for special grades of merchant steel premiums are readily paid. We quote: Iron finished tire, ½ x 1½ in. and larger, 2.60c., base; under ½ x 1½ in., 2.75c.; planished tire, 2.75c.; smooth channel tire, ¾ to ⅞ and 1 in., 2.85c. to 2.90c.; 1⅛ in. and larger, 3.10c.; toe calk, 3.10c. to 3.15c., base; flat sleigh shoe, 2.75c.; concave and convex, 2.85c.; cutter shoes tapered or bent, 3.25c. to 3.35c.; spring steel, 3.25c. to 3.50c.; machinery steel, smooth finished, 2.90c. to 3c., all f.o.b. at mill.

Hoops and Bands.—Most consumers are covered over the remainder of the year and specifications are active. For current orders for fairly prompt shipment, hoops are 3c. and steel bands 2.60c. at mill, with extras on the latter as per the steel bar card. For fairly prompt shipment steel bands are quoted at 2.75c. and higher.

Wrought Pipe.—Reports are that two fairly large gas lines in iron pipe have been placed with local mills. It is doubtful, however, whether any considerable orders of line pipe will be placed for delivery this year, as the mills are filled up so far ahead on lap-weld pipe they could not possibly make the deliveries. As stated before, mills are sold up five to six months ahead on lap-weld sizes but can ship out butt-weld sizes promptly. The new demand for oil country goods has fallen off, due to the decline in oil, and some contemplated drilling work has been stopped. Discounts on both iron and steel pipe, given on another page, are firmly held.

Boiler Tubes.—Most large consumers are covered ahead for this year, and some over the first half of 1917. Mills are sold up on locomotive and merchant tubes anywhere from six to 10 months, and on seamless tubes to July, 1917, or longer. Discounts on iron and steel tubes, as given on another page, are firm.

Coke.—There is still a scarcity of high grade furnace coke for prompt shipment, and this week it has sold at as high as $2.90 per net ton at oven. The Youngstown Sheet & Tube Company is now operating all of its 204 Koppers by-product ovens, and this releases a very large amount of beehive furnace coke to go elsewhere. We quote best grades of blast-furnace coke for prompt shipment at $2.90 to $3 per net ton at oven, and on contracts $2.50 to $2.60. There is no inquiry for contract furnace coke, as furnaces are covered. Prices on best grades of 72-hr. foundry coke are also higher, and we quote prompt at $3.25 to $3.50, and on contracts $3.50 to $3.75, per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended Aug. 19 as 408,060 net tons, an increase over the previous week of 4720 tons.

Old Material.—It is stated that the Carnegie Steel Company, which bought about 80,000 tons of heavy steel scrap in July, has piled practically all of this scrap that it has taken in and recently declared an embargo on further shipments, which is still on. The market on borings and turnings is very dull, prices on the latter being particularly weak. There is some movement in low phosphorus melting stock at $19.50 to $20, delivered. The American Steel Foundries is credited with having bought 8000 to 10 000 tons of selected heavy steel scrap for Sharon and Alliance at $16.25 per gross ton, delivered, or slightly higher. Prices now being quoted by dealers for delivery in Pittsburgh and points that take the same rates of freight, per gross ton, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$16.00 to $16.25
No. 1 foundry cast	14.50 to 14.75
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.50 to 17.00
Hydraulic compressed sheet scrap	13.50 to 14.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.25 to 11.50
Bundled sheet stamping scrap	10.25 to 10.50
No. 1 railroad malleable stock	14.50 to 14.75
Railroad grate bars	10.25 to 10.50
Low phosphorus melting stock	19.75 to 20.00
Iron car axles	28.00 to 28.50
Steel car axles	28.00 to 28.50
Locomotive axles, steel	33.00 to 35.00
No. 1 busheling scrap	14.00 to 14.25
Machine-shop turnings	7.00 to 7.25
Old carwheels	13.25 to 13.50
Cast-iron borings	8.00 to 8.25
*Sheet bar crop ends	17.00 to 17.50
No. 1 railroad wrought scrap	18.00 to 18.75
Heavy steel axle turnings	10.50 to 10.75
Heavy breakable cast scrap	12.25 to 12.50

*Shipping point.

Chicago

CHICAGO, ILL., Aug. 29, 1916.

The buying of pig iron has become more widespread, although most of the quantities on which figures are being taken are 1000 tons or less. Activity has shifted from basic to foundry iron, with charcoal and malleable iron also in demand. Prices have strengthened both in the South and North, but competition is still holding down the quotations of local furnaces. The railroads are again showing an interest in supplies for next year. One sale of 20,000 tons of standard Bessemer rails is noted, as well as inquiry for an additional 20,000 tons. The Santa Fé has placed its order for tie-plates. In finished lines the only exception to the general condition of greatly protracted delivery is the renewal of premium quotations for prompt shipments of bars, shapes and plates. One mill is asking 2.75c. for high carbon open-hearth and Bessemer bars, 2.85c. for Bessemer shapes and is disposing of plates exceeding 90 in. in width at 4c., Pittsburgh. Negotiations for railroad equipment continue of importance, the principal new inquiry being that of the Western Pacific for 1250 cars. Export inquiry, mainly from Japan, for bars, shapes and plates, continues to run into large figures, one mill having at least 20,000 tons of such material under consideration. The market for sheets is somewhat stronger without appreciable change in prices. Some adjustments of store prices in conformity with recent advances in mill prices are being made. Makers of bolts and nuts have rounded up quite a large business following the announcement of new discounts. The scrap market is noticeably firmer because of the apparent shortage of old material, but lack of buying retards the upward movement of prices.

Pig Iron.—While the disposition of the recent business in basic iron reduces the volume under consideration, inquiry for foundry grades is becoming more general and the buying movement is gathering headway. For non-competitive iron the market is stronger, having been steadied by the advance in Southern prices. For high phosphorus Northern iron, however, quotations are still ragged and local interests are underbidding Southern quotations, a price for last and first quarter shipment of less than $18.50, delivered, on an 85c. freight rate, for iron 2.25 per cent and over in silicon,

is noted. For basic and malleable most of the local furnaces are again quoting $19, while for foundry iron of standard Northern analysis quotations range downward to $18.50. Inquiry includes a considerable number of lots of 1000 tons and less of both foundry and charcoal iron, with one lot of charcoal iron of 3000 tons. For Northern iron no premium is being asked for first quarter delivery, but Southern furnaces are quoting $14 for prompt shipment, $14.50 for last quarter and $15 for first quarter. The local situation is strengthened somewhat by the prospect of one of the South Chicago furnaces blowing out for relining in the near future. For Lake Superior charcoal iron we quote delivery prices at Chicago to include a freight rate of $1.75. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$19.75
Lake Superior charcoal, No. 1	20.25
Lake Superior charcoal, No. 6 and Scotch	20.75
Northern coke foundry, No. 1	$18.50 to 19.00
Northern coke foundry, No. 2	18.00 to 18.50
Northern coke foundry, No. 3	17.50 to 18.00
Southern coke, No. 1 f'dry and 1 soft	18.50 to 19.00
Southern coke, No. 2 f'dry and 2 soft	18.00 to 18.50
Malleable Bessemer	19.00
Basic	18.00 to 18.50
Low phosphorus	34.00
Silvery, 8 per cent	29.50
Bessemer ferrosilicon, 10 per cent	32.50

Rails and Track Supplies.—The renewal of railroad inquiry for next year is unusual at this season. This inquiry covers a considerable quantity of track fastenings and 20,000 tons of rails for the Grand Trunk. The Southern Railway purchased 15,000 tons of Bessemer rails for delivery in the first half, subsequently increasing the order by 5000 tons. The Santa Fé reports having closed for its tie-plate requirements. Quotations are as follows: Standard railroad spikes, 2.75c., base; track bolts with square nuts, 3.25c. to 3.50c., base, all in carload lots, Chicago; tie-plates, $50, f.o.b. mill, net ton; standard section, Bessemer rails, Chicago, $33, base; open-hearth, $35; light rails, 25 to 45 lb., $40; 16 to 20 lb., $41; 12 lb., $42; 8 lb., $43; angle bars, 2c., Chicago.

Structural Material.—Steel fabricators report a more than comfortable supply of small jobs. New contracts in the past week include 120 tons for the General Electric Company's factory at Fort Wayne, 200 tons for a power station at Cincinnati, 320 tons for a mine shaft at Bessemer, Mich., and 500 tons for a bridge in Santa Barbara County, Cal. The Northwest Steel Company will fabricate 1600 tons for a post office at Portland, Ore., and the American Bridge Company, 1000 tons for additions to the Cook County Hospital, Chicago. Negotiations for the building of new cars and the repair of old ones embrace a number of lots of miscellaneous equipment and one lot of 1250 box cars for the Western Pacific. The New York Central has ordered 1000 cars from the Standard Steel Car Company. There is little local inquiry for plain material except in small lots for prompt shipment, much of which is being covered by offerings by Eastern mills of Bessemer shapes at advanced prices. One mill is quoting 2.85c., Pittsburgh. We quote for Chicago delivery of plain material from mill 2.789c.

We quote for Chicago delivery of structural steel from jobbers' stock 3.10c.

Plates.—Plate sales are of a miscellaneous character, the mills competing against the store price where prompt shipment is desired. Mill sales of narrow plates at prices ranging from 3.25c. to 3.50c. are noted, while for wide plates 4c. has been done in several instances. Inquiry for mixed lots of shapes and plates for shipbuilding purposes, largely for delivery to Japan, continues in large quantities, one such inquiry naming 20,000 tons. We quote for Chicago delivery of plates from mill at its convenience 3.189c. For prompt shipment we quote 3.439c. to 3.689c., in widths up to 72 in., and for wide plates 4.189c.

We quote for Chicago delivery of plates out of jobbers' stock 3.50c.

Sheets.—Makers of sheets have the support of a number of strengthening influences in the marketing of their product, particularly by reason of the very high prices being paid for sheet bars, but sheet prices, quoted to take the scattering business offered, show little improvement. Black sheets are still obtainable at prices as low as 2.85c., Pittsburgh, for No. 28, although 3c. is being quoted more frequently. Blue annealed sheets, particularly in the lighter gages, do not appear to be as firm as they were a number of weeks ago, but the market continues in the neighborhood of 3c. A number of sales of galvanized sheets are reported, but business is still obviously curtailed. We quote for Chicago delivery, blue annealed, No. 16 and heavier, 3.089c. to 3.339c.; box annealed, No. 17 and lighter, 2.939c. to 3.039c.; No. 28 galvanized, 4.289c. to 4.389c.

The price of black sheets out of store has been advanced $3 per ton. We quote for Chicago delivery of sheets out of stock, minimum prices applying on bundles of 25 or more, as follows: No. 10 blue annealed, 3.40c.; No. 28 black, 3.25c.; No. 28 galvanized, 4.65c. to 4.75c.

Bars.—Some Bessemer bars are being offered for prompt shipment at 2.75c. There has also been some selling for future delivery, one mill taking about 5000 tons last week. A few contracts were placed for rail carbon bars by the implement interests, the price being 2.50c., Chicago. The bar-iron situation is unchanged, with new tonnage scattering and the price still 2.35c. at the mill. We quote mill shipment, Chicago, as follows: Bar iron, 2.35c.; soft steel bars, 2.789c.; hard steel bars, 2.50c.; shafting, in carloads, 20 per cent off; less than carloads, 15 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 3.10c.; bar iron, 3.10c.; reinforcing bars, 3.10c. base with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 10 per cent off.

Rivets and Bolts.—The announcement of new discounts by the makers of bolts and nuts resulted generally in the closing up of outstanding quotations on the basis of lower prices, with a resultant booking of a fair aggregate of new business. We have revised our discounts according to the recent advance, and quote as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 50-5; cut thread, 40-10-2½; larger sizes, 35-2½; machine bolts up to ⅜ x 4 in., rolled thread, with hot pressed square nuts, 50-10; cut thread, 50; larger sizes, 40-5; gimlet-point coach screws, 50-5; hot pressed nuts, square, $2.70 off per 100 lb.; hexagon, $2.70 off. Structural rivets, ¾ to 1¼ in., 4c. to 4.15c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 3.75c.; boiler rivets, 3.85c.; machine bolts up to ¾ x 4 in., 60-10; larger sizes, 50-10; carriage bolts up to ¾ x 6 in., 60-5; larger sizes, 50 off; hot pressed nuts, square, $3.25, and hexagon, $3.25 off per 100 lb.; lag screws, 65.

Wire Products.—Demand for wire nails and barb wire is again assuming proportions considerably in excess of the ability of the mills to deliver, and the market stands exceedingly firm at the new level of prices. For fencing alone, the demand is noticeably light. We quote as follows per 100 lb.: Plain wire, Nos. 6 to 9, base, $2.839; wire nails, $2.789; painted barb wire, $2.939; galvanized barb wire, $3.639; polished staples, $2.939; galvanized staples, $3.639; all Chicago.

Cast-Iron Pipe.—Except for a contract for 300 tons of pipe for Fond du Lac, Wis., taken by the leading interest, new business of the past week was confined to orders of a routine character. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $33.50 to $34; 6-in. and larger, $30.50 to $31, with $1 extra for class A water pipe and gas pipe.

Old Material.—The basis for judging the values of scrap in the present period of proscribed buying is largely confined to the prices being paid to fill short orders representing old sales. The apparent scarcity of scrap, particularly of the grades obtained from the railroads and those prepared by the yard dealers, is more noticeable and has resulted in a general hardening of the market, with some advances in price. The scarcity is commonly attributed to labor shortage. On the other hand, consumers are displaying very little interest in further purchases, the reduced operations of the rolling mills in the past two months cutting into

their stock much less rapidly than was expected. The situation, however, is recognized to have in it a potential strength that needs only a resumption of buying to make it manifest in the form of rapidly advancing prices. With the exception of 1000 tons of old material offered from the Belt Railway of Chicago, railroad scrap was again negligible. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$18.75 to $19.25
Relaying rails	19.50 to 20.50
Old carwheels	11.50 to 12.00
Old steel rails, rerolling	16.50 to 16.75
Old steel rails, less than 3 ft.	15.75 to 16.00
Heavy melting steel scrap	15.25 to 15.75
Frogs, switching and guards, cut apart	15.25 to 15.75
Shoveling steel	14.75 to 15.25
Steel axle turnings	9.25 to 9.75

Per Net Ton

Iron angles and splice bars	$18.75 to $19.00
Iron arch bars and transoms	20.00 to 20.50
Steel angle bars	13.75 to 14.25
Iron car axles	25.50 to 26.00
Steel car axles	28.00 to 28.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.75 to 15.25
Cut forge	14.75 to 15.25
Pipes and flues	11.25 to 11.50
No. 1 busheling	13.00 to 13.50
No. 2 busheling	9.50 to 10.00
Steel knuckles and couplers	14.00 to 14.50
Steel springs	14.50 to 15.00
No. 1 boilers, cut to sheets and rings	10.25 to 10.75
Boiler punchings	13.75 to 14.25
Locomotive tires, smooth	20.00 to 20.50
Machine-shop turnings	5.50 to 6.00
Cast borings	6.25 to 6.75
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.25 to 9.75
Grate bars	10.00 to 10.25
Brake shoes	9.75 to 10.25
Railroad malleable	11.25 to 11.75
Agricultural malleable	10.75 to 11.25

Philadelphia

PHILADELPHIA, PA., Aug. 29, 1916.

The slight easing up which began about two months ago has entirely vanished, and the market is to-day strong in every direction. General business is good, and a greater scarcity of steel as well as of pig iron is widely predicted. New war orders and the export demand have absorbed raw and semi-finished steel to such an extent that offerings are no longer made. One must seek for steel and its products, and, if found, they are to be had only in limited quantities and at premium prices, if anything like prompt delivery is wanted. Makers of diversified products are receiving a vast amount of inquiry for lots ranging from 100 to 500 tons, mostly for delivery in the remainder of the year. Fear of a railroad strike is causing many consumers, including foundries, to request that immediate shipment be made to them. The demand comes from so many directions that it is difficult to be specific. The Southern Railway is inquiring for 5000 tons of track joints. Pig iron of all grades is livelier, good sales as well as inquiries being recorded. In plates, shapes and bars, a wide variance in price prevails. Plates and bars are more active than shapes. Coke is slow, and old material continues to drag, although the heavy export demand for steel axles is maintained.

Pig Iron.—The market is steadily gathering strength, with greater activity in both last-quarter and first-quarter deliveries, with the bulk of interest in deliveries over the remainder of the year. Not only is there an excellent volume of inquiry, but some important orders have been placed. The bulk of the tonnage contracted for consists of steel-making iron, but foundry grades are doing well, and would be more active were it not for the shortage of labor in foundries. A Chester pipe works is inquiring for 5000 tons of gray forge and No. 3, for delivery over the remainder of the year. Late last week 11,000 tons of eastern Pennsylvania basic was taken at $19.50 and $19.75, delivered in lots of 6000 and 5000 tons, the prices being 50c. and 75c. higher than that at which the last previous sale was made. Sellers are now asking $19.75 to $20, delivered. The movement of a few small lots brings the aggregate of basic sales in recent days close to 15,000 tons. More basic business is pending, one consumer in central Pennsylvania having made inquiry for 18,000 tons. An inquiry from outside of this territory calls for 12,000 tons. A shipbuilding company has closed for 500 tons of No. 3, delivery this year, and wants 1500 tons additional for the first quarter. Another consumer has taken 500 tons of No. 2 X, and another, who purchased 800 tons of malleable, is looking for 500 tons more. The minimum for malleable, delivered in this district, is about $20.58, but up to $22.44 has been paid for certain brands. Of an inquiry for 2000 tons malleable, 1700 tons has been placed. Another inquiry calls for 700 tons of No. 2 X and No. 2 plain. A Newport News interest is in the market. The Southern Railway is inquiring for a carload of special iron. A wide range in quotations continues to characterize Virginia iron, No. 2 X ranging from $20.25 to $21.25, delivered, and the sale is reported of 1500 tons of somewhat special Virginia iron at $19, furnace, but not for local delivery. A leading producer has made uniform his quotations for delivery this year and over the first six months of 1917, fixing the price for No. 2 X at $18.15, furnace, or $21.25, Philadelphia. Other makers ask $17.50, furnace, or $20.25, Philadelphia, for the approaching quarter. Standard low phosphorus is strong at $34 to $35, Philadelphia, and some lots of moderate size have been taken. Export inquiry for this and other grades continues active, a round lot having been taken by a Canadian interest. Italy and France want iron of various kinds, but especially Bessemer, one inquiry calling for 10,000 tons of the latter. Bessemer has been quoted for export at $22.69, $22.71 and $23, Philadelphia. A shipment of 4000 tons of Bessemer was made last week to the Italian Government, and a shipment to private consumers in Italy consisted of 1000 tons of low phosphorus. Quotations for standard brands, delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa., No. 2 X foundry	$19.50 to $20.00
Eastern Pa. No. 2 plain	19.25 to 19.75
Virginia No. 2 X foundry	20.25 to 21.25
Virginia No. 2 plain	20.00 to 20.75
Gray forge	18.50 to 19.00
Basic	19.75 to 20.00
Standard low phosphorus	34.00 to 35.00

Iron Ore—In the week ended Aug. 26 arrivals of foreign ore at this port consisted of 9868 tons from Sweden and 4200 tons from Chile.

Ferroalloys—The nominal price for 80 per cent ferromanganese, either domestic or foreign, is $175, seaboard, but it is known that this price is being shaded, and generally understood that $170 would be accepted. It is reported that 500 tons of domestic material, free of all restrictions, has been offered at the lower price. Spiegeleisen is unchanged at $50, furnace. Arrivals of English ferromanganese at this port last week totaled 399 tons. Fifty per cent ferrosilicon is unchanged at $86 to $88, Pittsburgh.

Plates.—The tightness of the market is illustrated by the action of a local mill in refusing to consider an export order for 6000 tons, prompt delivery, no matter what price figured. Large consumers in the Pittsburgh district have written and telephoned to local makers for plates, only to be refused. The order for Russian locomotives, which will require a goodly tonnage of plates, is still hanging fire. A large mill estimates that it has sufficient orders booked to run until next July. Prices show but little change, although in one or two cases small lots for prompt delivery have commanded very fancy premiums. Two makers quote 4.159c., Philadelphia, as their minimum, one of them feeling the shortage of open-hearth steel. Another mill quotes 3.159c. to 4.159c., Philadelphia, according to delivery, the nearest being eight to ten weeks.

Bars—A maker of Bessemer bars quotes a minimum of 2.759c., Philadelphia, to preferred customers, and up to 3.159c. for small lots. Open-hearth bars also are quoted at 2.759c., Philadelphia, minimum, but they are difficult to procure, some makers asking 3.659c., Philadelphia. Iron bars are unchanged at 2.50c., Pittsburgh, or 2.659c., Philadelphia. Sales have been made of bars rolled from old steel rails.

Structural Material—Quotations cover an unusual range. For a desirable order one mill will accept

2.759c., Philadelphia, but is asking up to 3.159c. for merchant lots. On the other hand, another mill has sold 2000 tons to a jobber at 2.909c., Philadelphia, and now quotes Bessemer shapes at 3.009c., Philadelphia. As for open-hearth shapes it is not inclined to let them go under 3.50c., Pittsburgh. The contract for 700 tons of steel required by the E. G. Budd Mfg. Company, Philadelphia, maker of automobile bodies, is soon to be let. Bids for the Southern Hotel, Baltimore, requiring 1000 to 1200 tons, will be taken Sept. 6. While the market is stronger and somewhat more active, the volume of sales is not nearly so great as it was two or three months ago.

Billets—A short time ago makers were occasionally offering billets here and there, but these lots have disappeared. Open-hearth rerolling billets are quoted at $48 and upward. Forging billets have sold up to $65, Eastern mill. For spring steel and other special steel $55 has been paid. Raw and semi-finished steel has been pretty well absorbed by the munitions makers and by the export demand. The export demand is strong, but much of this business is declined.

Sheets—The quotation is unchanged, with the demand slightly quieter at 3.159c. to 3.659c., Philadelphia, for No. 10 blue annealed.

Coke—Coke is moving slowly, although spot furnace is strong because of a shortage. Spot furnace is quoted at $2.75 to $2.85 and contract (nominal) at $2.50 per net ton at oven. Spot foundry, the production of which is restricted, is quoted at $3.25 to $3.50 per net ton at oven, and contract foundry at the same figures. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material—Not much is doing, although there is some demand, at lower prices, for machine-shop turnings for blast-furnace consumption, and a limited demand for wrought pipe. Coatesville is still under embargo. Steel axles maintain their strength because of the heavy export demand. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$14.75 to $15.25
Old steel rails, rerolling	17.00 to 18.00
Low phos. heavy melting steel scrap	21.25 to 23.50
Old steel axles (nominal)	30.00 to 31.00
Old iron axles (nominal)	28.00 to 29.00
Old iron rails	20.00 to 20.50
Old carwheels	15.50 to 16.00
No. 1 railroad wrought	20.00 to 21.00
Wrought-iron pipe	13.00 to 13.50
No. 1 forge fire	12.50 to 13.00
Bundled sheets	12.50 to 13.00
No. 2 busheling	10.50 to 11.00
Machine-shop turnings	7.25 to 7.75
Cast borings	9.00 to 9.50
No. 1 cast	16.00 to 16.50
Grate bars, railroad	11.75 to 12.25
Stove plate	11.75 to 12.25
Railroad malleable	13.50 to 14.00

Cleveland

CLEVELAND, OHIO, Aug. 29, 1916.

Iron Ore.—Some additional chartering of vessels for September shipments at the going rate of $1 a ton, free, is reported and a contract for a small tonnage for September shipment is reported to have been closed at $1.25, free. Offers are understood to have been made at 75c. for ore for next season, but vessel men have declined to contract at that price. Shipments have been very heavy during the month, and the August movement is expected to be well over the 9,000,000-ton mark. The sale of a small tonnage of ore for this season's delivery is reported, but there are no new inquiries in the market, although there is some talk of a shortage before the opening of the next season of navigation. We quote ore prices as follows, delivered lower lake ports: Old range Bessemer, $4.45; Mesaba Bessemer, $4.20; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.55.

Pig Iron.—Cleveland selling agencies report considerable inquiry from the East for basic, foundry and malleable iron for delivery during the first quarter and the first half of next year. However, in the northern Ohio territory, as well as in Michigan and Indiana, the market is quiet. Foundry iron prices have stiffened in Cleveland and in the Valley and $18 iron has disappeared. One interest which had been credited with being the lowest seller has advanced its price to $18.50 for No. 2 foundry, Cleveland and Valley furnace, and this is now the minimum price in this city either for local delivery or outside shipment. Owing to strikes and scarcity of labor, foundries in this territory will carry considerable iron over into next year. Many foundries will have enough iron left over to last for two or three months next year. The labor situation has caused considerable holding back of shipments and has a tendency to delay the buying movement for delivery after July 1. Southern iron is inactive, with the usual quotation of $14, Birmingham, for No. 2 for this year and $14.50 for the first half. We quote, delivered Cleveland, as follows:

Bessemer	$21.95
Basic	18.95
Northern No. 2 foundry	18.80
Southern No. 2 foundry	$18.00 to 18.50
Gray forge	18.50
Jackson Co. silvery 8 per cent silicon	28.62
Standard low phos., Valley furnace	32.00

Coke.—Owing to the shortage of labor in the Connellsville region producers are having trouble in keeping foundries supplied and find it necessary to ship some coke in open cars. As consumers are about all under contract, there is practically no demand. We quote standard Connellsville foundry coke at $3.25 to $3.50 per net ton at oven for prompt shipment and contract. Furnace coke for prompt shipment is held at $2.75 to $2.85.

Finished Iron and Steel.—There is a good demand for small lots of steel for prompt shipment, but not a great deal of inquiry for contracts. The pressure on the mills for deliveries is as great as ever. Jobbers are having trouble in getting shipments as promptly as desired on old contracts, and some are placing orders to replenish stocks with mills able to make early deliveries at 2.60c. for steel bars and 2.75c. for structural material. As warehouse prices are not changed, this means that jobbers' profits on these stocks will be considerably less than of late. New structural inquiry is light. The market is firm, and one mill has advanced its price on Bessemer shapes $2 a ton to 2.85c., Pittsburgh. The demand for plates continues heavy. Prices range from 3c. to 4c. Pittsburgh, the latter price being for light plates and in wide sizes, largely for the boiler trade. Some mills making hard-steel bars are eager for business, and are shading prices considerably. An inquiry for 1000 tons for a reinforced-concrete factory building for the B. F. Goodrich Company, Akron, Ohio, is understood to have brought out a price of about 2.30c., at mill, or $4 a ton below the general market price. Bar iron is quoted at 2.45c. to 2.50c., Cleveland. We note the sale of 300 tons of Bessemer billets at $45, Youngstown, for prompt shipment. Sheet prices are irregular. Some mills are asking higher prices, but others, apparently still having a supply of low-priced sheet bars, have not changed their quotations. One Youngstown mill has advanced its price to 3.30c. for black and blue annealed sheets and 4.50c. for galvanized. We quote black sheets at 2.90c. to 3c., Ohio mill, for No. 28; blue annealed at 3c. to 3.25c. for No. 10, and galvanized at 4.15c. to 4.40c. for No. 28. Warehouse prices are 3.25c. for steel bars and structural material; 3.65c. for plates, and 3.20c. for iron bars.

Bolts, Nuts and Rivets.—Bolt and nut specifications are fairly heavy, and some business is being taken at the new price, which is being well maintained. Rivet consumers are closing contracts for the fourth quarter at regular prices. We quote rivets at 4c., Pittsburgh, for structural, and 4.10c. for boiler rivets. Bolt and nut discounts are as follows:

Common carriage bolts, ⅝ x 16 in., smaller or shorter, rolled thread, 50 and 5; cut thread, 40, 10 and 2½; larger or longer, 35 and 2½; machine bolts within h. p. nuts, ⅝ x 4 in., smaller and shorter, rolled thread, 50 and 10; cut thread, 50; larger and longer, 40 and 10; lag bolts, gimlet or cone point, 50 and 5; square h. p. nuts, blank or tapped, $2.70 off the list; hexagon h. p. nuts, blank or tapped, $2.70 off; c. p. c. and t. sq. nuts, blank or tapped, $2.40; hexagon nuts, all sizes, $2.80 off; cold pressed semi-finished hexagon nuts, all sizes, 60 and 5.

Old Material.—The local scrap market is unusually dull, and not firm. Cleveland mills are practically out of the market, and about the only sales that are being made are for shipment to other points. Borings are slightly firmer owing to some activity in the Pittsburgh district. Prices are unchanged. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Steel rails	$14.75 to $15.00
Iron rails	18.50 to 19.00
Steel car axles	32.00 to 33.00
Heavy melting steel	15.00 to 15.50
Carwheels	12.75 to 13.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	12.50 to 12.75
Railroad malleable	14.00 to 14.25
Steel axle turnings	12.00 to 12.50
Light bundled sheet scrap	12.00 to 12.25

Per Net Ton

Iron car axles	$24.00 to $25.00
Cast borings	5.75 to 6.00
Iron and steel turnings and drillings.	5.25 to 5.50
No. 1 busheling	11.00 to 11.25
No. 1 railroad wrought (nominal)	15.00 to 15.50
No. 1 cast	13.00 to 13.50
Railroad grate bars	10.00 to 10.50
Stove plate	10.00 to 10.25

Birmingham

BIRMINGHAM, ALA., Aug. 28, 1916.

Pig Iron—A change in the situation has occurred in the week, several fairly large sales of iron having been made. The buying movement that was expected in the first part of September has already developed. One concern sold about 12,000 tons, a second is known to have sold 10,000 tons and a third sold 8000 tons. Sales by others were also made. The third interest above referred to sold several thousand tons of special iron and has booked 4000 tons of export iron for September. Producers are unanimous in saying that the buying movement now begun is expected to be one of the largest and most satisfactory in a long time. Most notable is the general return of confidence. The sales made were on the basis of $14 to $15 for No. 2. Some of the iron was sold at $14.50 basis for spot while some went for $15, which is now being quoted for the first quarter of 1917, but with no sales yet reported. Big consuming interests were the largest purchasers. When smaller consumers discovered that others were buying quietly a scramble to get in on the movement was started. A discouraging phase of the situation is the car shortage, which is becoming worse every week, and with the movement of crops this fall the iron makers here are fearful that an unprecedented car shortage will result. About 35c. per ton, it is estimated, has been added to the cost of making pig iron here, through the operation of new rates on raw materials from mines to furnaces in this district. The new rates, which went into effect Aug. 15, were an increase from 12½c. per ton to 17½c. on coal, coke, ore and limestone. This nullifies the decrease of about 35c. in the rates on iron to Northern points gained some time ago by the pig-iron interests through a fight of two years before the Interstate Commerce Commission; in fact, it goes further, since the increased cost of production goes on all iron made here, whereas the decrease in Northern rates applies only to a part of the tonnage from the district. We quote, per gross ton, f. o. b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$15.00 to $15.50
No. 2 foundry and soft	14.50 to 15.00
No. 3 foundry	14.00 to 14.50
No. 4 foundry	13.75 to 14.25
Gray forge	13.50 to 14.00
Basic	14.50 to 15.00
Charcoal	22.00 to 22.50

Cast-Iron Pipe—The tone of the market is steady, with a hopeful feeling for the future. Several small orders were received the past week. The pipe manufacturers are anxiously awaiting the decision of the Interstate Commerce Commission as to the plea for a suspension of the new transcontinental tariffs, scheduled to become effective Sept. 1. We quote, per net ton, f. o. b. pipe shop yards, as follows: 4-in., $28; 6-in. and upward, $25, with $1 added for gas pipe and 16-ft. lengths.

Coal and Coke—The greatest trouble with the coal situation here now is the car shortage, which is hampering the trade of a number of companies that for the first time in a year or so have secured orders in any quantity at all. The coke market is good, with standard beehive coke selling at $4.25 to $4.50 per net ton at oven and furnace coke $3.25 to $3.50.

Old Material—Several sales have been made, but at low prices, owing, in part, to the heavy productions of steel scrap at the mills manufacturing shrapnel shapes. We quote, per gross ton, f. o. b. dealers' yards, as follows:

Old steel axles	$24.00 to $30.00
Old steel rails	10.00 to 10.50
No. 1 steel scrap	9.25 to 9.75
No. 1 wrought scrap	12.50 to 13.00
No. 1 cast scrap	10.50 to 11.00
Extra heavy cast scrap	9.50 to 10.00
Stove plate and light	9.00 to 9.50
Old carwheels	9.50 to 10.00
Tram carwheels	9.50 to 10.00

Buffalo

BUFFALO, N. Y., Aug. 29, 1916.

Pig Iron.—The market is increasingly strong, with sales for the week aggregating fully 100,000 tons, perhaps more, and embracing all grades—foundry, malleable, basic and Bessemer. This makes a total of about 150,000 tons placed in the Buffalo district in the past two weeks. A large number of pig iron users have not yet come into the market for their requirements for the first half of next year, and producers anticipate a continuance of contracting in the next few weeks. Melters are busy to the limit of their ability to get out material, but owing to strikes, scarcity of labor and other drawbacks, it is estimated that the majority of foundries are operating at only about 65 per cent of capacity. The price range is now $18.50 to $20 at furnace for No. 2X, with one interest disposed to ask $19 as minimum. One of the three stacks of the Buffalo Union Furnace Company is now operating on basic iron. We quote as follows, f.o.b. Buffalo furnace, for last half and first half of next year:

No. 1 foundry	$19.00 to $20.00
No. 2 X foundry	18.50 to 19.50
No. 2 plain	18.50 to 18.75
No. 3 foundry	18.25 to 18.75
Gray forge	18.25 to 18.50
Malleable	18.50 to 19.00
Basic	19.00 to 19.50
Bessemer	21.00 to 21.50
Charcoal, regular brands and analysis	21.00 to 22.00

Finished Iron and Steel.—Inquiries received during the week by a number of agencies were in larger volume than for a number of months. Some of the mills report that they are forced to pro-rate tonnages, and it is known that a number of the larger users were unable to cover for all the steel they wanted because of the inability of mills to render service. It is predicted that larger tonnages will be carried into next year than mill managers anticipated; consequently they are showing greater reluctance to add to their present obligations, and even many preferred customers are finding it impossible to get material as required. This is especially true of bars, plates and structural shapes. The Lackawanna Steel Company will furnish the sheet steel piling for retaining walls for the new Bank of Buffalo Building, Buffalo, about 100 tons. The 1200 tons of structural steel for the new Central Elevator on Buffalo River was awarded to the Buffalo Structural Steel Company.

Old Material.—A strong buying movement has set in, with the demand for heavy melting steel and cast borings in the lead. Local consumers as well as users outside of the Buffalo territory are in the market. Dealers are watching the iron ore situation and the possible shortage owing to inability to secure boats to bring down the lakes the tonnage required; and are looking for a good demand for borings and turnings from blast furnaces. All dealers in this district consider that prices are due to advance. The ever present floating tonnages are, however, being moved at current market prices. As a matter of fact some brokers are offering more to-day than mills are paying, largely due to the fact that the buying movement which

was predicted for September has developed with considerable force somewhat ahead of the expected time. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.50 to $16.00
Low phosphorus steel	20.00 to 20.50
No. 1 railroad wrought scrap	17.25 to 17.75
No. 1 railroad and machinery cast scrap	15.50 to 16.00
Steel axles	26.00 to 26.50
Iron axles	24.00 to 24.50
Carwheels	13.00 to 13.50
Railroad malleable	15.00 to 16.00
Machine shop turnings	6.00 to 6.50
Heavy axle turnings	12.00
Clean cast borings	7.50 to 7.75
Iron rails	18.00 to 18.50
Locomotive grate bars	11.50 to 12.00
Stove plate (net ton)	11.00 to 11.50
Wrought pipe	12.00 to 12.50
Bundled sheet scrap	11.50 to 12.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	11.00 to 11.50
Bundled tin scrap	15.00 to 15.50

New York

NEW YORK, Aug. 30, 1916.

Pig Iron.—Foreign and domestic inquiries for pig iron, including 34,000 tons for a pump company and 30,000 tons, chiefly steel-making iron, for export, amount to 75,000 to 85,000 tons. Foundry iron sales in this immediate vicinity have not been heavy. In Connecticut 4000 tons of foundry iron was taken and some malleable business was done there. A 5000-ton lot of foundry iron inquired for by a northern New Jersey interest is still pending and the iron for 1917 delivery in the case of the pump company is to be taken up in the latter part of this week. The General Electric Company is expected to buy some Northern foundry iron, its recent purchases being chiefly of Southern. Figuring Alabama iron at $14.50 at furnace, which can be shaded, the price on Old Dominion docks in New York harbor would be $18.75, to which 50c. lighterage is to be added. Northern sellers are not meeting this price. Generally speaking, with two weeks of activity prices are firmer, but most of the iron put through thus far has been at the concessions with which a buying movement generally starts. No little irregularity has been seen in delivered prices in New York State, where there has been a good deal of activity, much of it in quiet transactions. Buffalo furnaces are not uniform in their rating of silicon values. A furnace outside of the Buffalo district has been making prices which would figure back quite a little under $18.50 Buffalo equivalent for No. 2 X. Virginia furnaces have been able for some time to take New England business, their delivered prices running from $20.25 to $20.50 for No. 2 X, but they are quoting on a higher basis now. More iron will be needed by some foundries for 1916, but the present buying is mostly concerned with the first half of next year. A large western New York steel foundry is in the market for 18,000 tons of iron, mostly basic, with some malleable. We quote at tidewater for early delivery: No. 1 foundry, $20 to $20.50; No. 2 X, $19.50 to $19.75; No. 2 plain, $19.25 to $19.50; Southern iron at tidewater, $19.25 to $19.75 for No. 1 and $18.75 to $19.25 for No. 2 foundry and No. 2 soft.

Structural Material—No mill seems to be quoting below 2.60c., Pittsburgh, and though there are rumors that 2.50c. still obtains, the indications are that in September 2.60c. will be the minimum. Much of the fabricated work which has been closed in the last week represents the results of announcements of early withdrawal of existing quotations for the plain material in these particular cases. The expected building movement to come in a few weeks has not yet become visible, and, of course, railroad buying in any department is held back owing to the threatened general railroad strike. Foreign offerings in structural material continue, but seem almost wholly for war purposes. Much of this is in bar mill sizes. A recent sale of 12,500 tons of 5-in. I-beams carries an option for 10,000 tons more. However, an inquiry for 10,000 tons of sheet piling for Italy is noted and a considerable amount of 1½ and 2-in. angles for France. Early expectations of wide inquiry from non-belligerent nations, though not actually wanted by the mills, are likely to receive a check through the indications of advances in ocean freight rates from the relatively low level to which they have dropped in the last month. The late awards for fabricated work include 900 tons for the Jattison Construction Company to the Harris, Silvers, Baker Company; 600 tons for the Mulliken and Moeller apartment, 302 West Eighty-sixth Street to the Hay Foundry & Iron Works; 600 tons for the Fischell loft, Fifth Avenue and Seventy-fourth Street, and 350 tons for a Levy apartment, both to the Passaic Structural Company, and 275 tons for an apartment house at 42 West Tenth Street to the Hinkle Iron Company. A number of other good size jobs are expected to close before the end of the week, and among new projects not hitherto mentioned may be numbered another Tishman apartment, Seventy-second Street and Lexington Aveue, 800 tons; the Campagna apartment, Ninety-fourth Street and West End Avenue, 500 tons; apartment for T. J. McLaughlin, 105th Street and Broadway, 650 tons; the Ditson Building, Boston, 700 tons; bridge work for the New York Central, 200 tons, and a coal stocking bridge for the same road at Syracuse, 200 tons; 500 tons for substructure work for a Paterno apartment over the Grand Central terminal area, and a church, rectory and school, Broadway and Seventieth Street, 450 tons. We quote mill shipments of plain structural shapes at 2.769c. to 3.019c., New York, for delivery in two or three months, and from warehouse 3.25c., New York.

Steel Plates.—The largest offering noted locally covers close to 7000 tons of plates for six ships for Japan. Some considerable differences in quotations are discovered. In one recent case of a few hundred tons for shipment in a few weeks, prices ranged from 3.15c. to 4c., Pittsburgh, and a late sale of a moderate tonnage for early shipment for tank plates up to about 5 ft. or so in width brought 3.25c., Pittsburgh. The mills making these prices, it is thought, have now been filled up to some extent, and quotations for tank plates below 4c. are difficult to secure. Even 3.75c., Pittsburgh, is the usual minimum for universal plates, which are not in good demand. We quote plates from warehouse at 4c., New York, and in view of the availability from this source, fabricators are not inclined to take on tonnage contracts for universal plates for the fourth quarter, particularly with no active building work yet discernible.

Steel and Iron Bars.—There are signs that consumers have now become concerned over their supplies for the last of this year and even for the first part of next, having apparently become satisfied concerning price stability. Tonnage business is coming out constantly from the buyers for the belligerents, and these carry good prices, besides being attractive from the standpoint of size. In addition to two lots of angles totaling about 6000 tons, some 8000 tons are now under consideration. Some of this business has been done at 3c., Pittsburgh, and a quotation of 3.10c., is regarded as likely. Not only has shell steel demand not been satisfied, but the effort now is to secure further orders for shell forgings on which deliveries will be taken to June 1, which is two months beyond the period for which the late forging contracts were closed. We quote mill shipments of steel bars at 2.769c., New York, for delivery at the convenience of the mills, and bar iron at 2.669c., New York, in say two months. Out of store iron and steel bars are sold at 3.25c.

Ferroalloys.—The situation as to future supplies of British ferromanganese is mixed. Some producers have not yet been granted any August licenses while others have had not trouble and report shipments thus far in August to have been satisfactory. It is evident that an important move is in contemplation. Reports received by sellers here indicate the blowing in of some ferromanganese furnaces on pig iron so as to increase the British pig-iron output, so great is the demand. The market as a whole is quiet, with inquiries and sales very few. Ferromanganese for any delivery is obtainable at $170 to $175, furnace, with the former quotation acceptable by some domestic producers. Spiegeleisen is quiet at $45 to $50, furnace, practically a nominal quotation. There is some foreign inquiry. Ferrosilicon,

50 per cent, is still in strong demand, and it is reported that a new producer in central New York is accepting orders.

Cast-Iron Pipe.—Current demand is quiet. Practically no public lettings are in sight, and private buying is considerably less active than it has been. Pipe manufacturers regard the lull as only temporary, being quite confident that, if the present buying movement in pig iron should advance the price of that commodity, consumers of pipe will come into the market for what they may need before the closing in of winter. Carload lots of 6-in., class B and heavier, are quoted at $30.50 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—The iron rolling mills of eastern Pennsylvania continue to be buyers of moderate lots of railroad wrought scrap and wrought pipe, prices of which have again slightly stiffened. Machine-shop turnings, which have long been completely neglected, are in renewed demand from blast furnaces, but prices show no disposition to advance. Steel scrap is extremely quiet, as embargoes in eastern Pennsylvania are continued and large consumers in western Pennsylvania are requesting shipments deferred. Brokers purchasing for the Pittsburgh market continue to quote $13 to $13.25, New York, for heavy melting steel scrap. They quote buying prices for the Eastern trade about as follows, to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (eastern Pennsylvania specifications)	$11.75 to $12.00
Old steel rails (short lengths) or equivalent	12.50 to 12.75
Relaying rails	27.50 to 28.00
Rerolling rails	16.75 to 17.00
Rerolling rails (for export)	19.00 to 20.00
Iron car axles	29.00 to 30.00
Steel car axles (for export)	35.00 to 36.00
No. 1 railroad wrought	18.50 to 18.75
Wrought-iron track scrap	15.50 to 16.00
No. 1 yard wrought, long	13.50 to 14.00
No. 1 yard wrought, short	11.75 to 12.00
Light iron (nominal)	3.50 to 4.00
Cast borings (clean)	6.75 to 7.00
Machine shop turnings (nominal)	4.25 to 4.50
Mixed borings and turnings	4.25 to 4.50
Wrought pipe	11.25 to 11.75
Old carwheels (nominal)	15.00 to 15.50
Malleable cast (railroad)	12.00 to 12.50

Foundries are buying a little more freely, but quantities are small. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

No. 1 cast (machinery)	$16.00 to $16.50
No. 2 cast (heavy)	14.50 to 15.00
Stove plate	11.50 to 12.00
Locomotive grate bars	10.00 to 10.25

St. Louis

ST. LOUIS, MO., Aug. 28, 1916.

Pig Iron.—As a direct result of the heavy commitments of large local purchasers reported last week, the smaller concerns have begun to flood the market with inquiries. Some are specific and others tentative. Representatives are accordingly putting up numerous proposals to the furnaces and getting a liberal number of acceptances. Apparently the smaller foundries have reached the conclusion that first half deliveries have been endangered for them and they are rushing to cover. Sales reported for the past week include one of 1000 tons of Northern, three of 1000 tons each of Southern No. 2 and several lots of 700, 600 and 500 tons each of Northern and Southern iron.

Coke.—Transactions are altogether in small lots for immediate delivery or special requirements. By-product coke continues to be well held on a parity with Connellsville figures.

Finished Iron and Steel.—Business continues undiminished, but it is an aggregate of small lots. There is an increase of pressure for the delivery of material already under contract, and consumption is evidently increasing among fabricators. Movement out of warehouse remains good and the higher prices are being paid freely by consumers who cannot wait for deliveries on contracts. We quote for stock out of warehouse as follows: Soft steel bars, 3.15c.; iron bars, 3.10c.; structural material, 3.15c.; tank plates, 3.55c.; No. 10 blue annealed sheets, 3.45c.; No. 28 black sheets cold rolled, one pass, 3.45c.; No. 28 galvanized sheets, black sheet gage, 4.80c. to 5c.

Old Material.—Mills have not yet entered the market. Some high prices are being paid to cover short contracts and the market in consequence is particularly stiff on quotations, with relatively little material moving even among the dealers. A labor shortage in the scrap yards interferes with handling and preparing material for consumers. Relayers are very firm, especially in heavy sections, while light rails are active at good prices. The only list out during the week was one of 3000 tons from the Burlington. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$16.25 to $16.75
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft.	15.00 to 15.50
Relaying rails, standard section, subject to inspection	23.00 to 24.00
Old carwheels	11.50 to 12.00
No. 1 railroad heavy melting steel scrap	15.00 to 15.50
Heavy shoveling steel	13.50 to 14.00
Frogs, switches and guards cut apart	14.50 to 15.00
Bundled sheet scrap	8.00 to 8.50

Per Net Ton	
Iron angle bars	$16.00 to $16.50
Steel angle bars	13.50 to 14.00
Iron car axles	26.00 to 26.50
Steel car axles	27.00 to 27.50
Wrought arch bars and transoms	21.00 to 21.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.00 to 15.50
Railroad springs	15.00 to 15.50
Steel couplers and knuckles	14.00 to 14.50
Locomotive tires, 42 in. and over, smooth inside	20.50 to 21.00
No. 1 dealers' forge	10.25 to 10.75
Cast-iron borings	7.00 to 7.50
No. 1 busheling	13.50 to 14.00
No. 1 boilers, cut to sheets and rings	9.50 to 10.00
No. 1 railroad cast scrap	11.00 to 11.50
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.00 to 10.50
Pipes and flues	11.00 to 11.50
Railroad sheet and tank scrap	9.75 to 10.25
Railroad grate bars	9.50 to 10.00
Machine-shop turnings	7.00 to 7.50

British Steel Market

High Prices for Bessemer Wire Rods and American Billets—Pig Iron Strong

LONDON, ENGLAND, Aug. 30, 1916.—(*By Cable.*)

The pig-iron market is strong, with the demand unrelaxed and the position of hematite iron still acute. The demand for tin plate is increasing, but business is difficult except against government orders, quotations being irregular at 33s. to 35s. Tin plates from stock command a premium. American billets are in demand, but the terms are discouraging to transactions, about £14 5s. being asked for September and October delivery. For Bessemer wire rods for late September delivery £19 is asked. Quotations are as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 33s. to 35s., against 32s. to 35s. a week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £20 5s.

Steel ship plates, Scotch, delivered local yards, £13 17s. 6d.

Steel rails, export, f.o.b. works, £10 17s. 6d.

Hematite pig iron, f.o.b. Tees, about 140s.

Sheet bars (Welsh) delivered at works in Swansea Valley, £10 7s. 6d.

Steel bars, export, f.o.b. Clyde, £18.

Ferromanganese (nominal), £35.

Ferrosilicon, 50 per cent, c.i.f., £29.

(*By Mail*)

Pig Iron Tight and Steel Very Scarce—The Manganese Market

LONDON, England, Aug. 15, 1916.—The general situation is almost entirely under government control from raw to finished material, as emphasized by the recent extension of export prohibitions. With the more acute pressure of munition work and productive capacity already fully engaged over the rest of the year in most directions, the prosecution of new business has become a matter of increasing difficulty. There is no stock available at works, and but few odd lots can be spared here and there out of current output.

Pig iron is extremely tight, and, although domestic deliveries of Cleveland common foundry iron have proved more satisfactory, there is a necessity for an enlarged output, but many labor and raw material difficulties have yet to be overcome before the promised freer output, especially of hematite, can be realized. The forward demand continues unabated, and hematite makers are heavily booked ahead, while Cleveland producers are more reticent about extending their bookings into the fourth quarter.

The chief export feature has been the progress of the shipments to France, the total sent from United Kingdom ports last month having been 53,017 gross tons, making for the eight months an aggregate of 320,910 tons against only 36,506 tons in 1915. Export business otherwise is extremely reduced and difficult, for very few permits are obtainable. The reserve stocks of warrant iron have dwindled further to 20,000 tons as compared with about 150,000 tons at this time last year.

The scarcity of semi-finished steel is daily more acute, although the official price of Welsh bars is being retained at £10 7s 6d, at which figure only limited quantities are obtainable for sheets and tin plates. It is now understood that practically no steel will be allocated by the Ministry of Munitions except for government work. Therefore, more strenuous attempts are seemingly being made to procure American material which, however, is again much tighter, especially 2-in. to 3-in. billets and sheet bars, comparatively few offers being reported for shipment this quarter, with 2-in. billets quoted up to about £17. But 4-in. material for next quarter can be had near £15 c.i.f. Liverpool.

NEW RUSSIAN MANGANESE COMPANY

There has been practically no change in ferromanganese, and there is very little doing. The British combination is sold out for the remainder of this year, the small inquiries coming from the Continent being met by outside interests at about £35, basis f.o.b. for loose. Indian manganese ores ruled easier, more or less in sympathy with freight costs, with some business done recently at about 2s 2d per unit for near shipment to East Coast ports, a few small lots of low grade Welsh ore having also been sold at 1s 6d and upward per unit, the marketing of such material now being found fairly profitable owing to the high c.i.f. costs affecting imported ores.

It is reported that a new Russian manganese ore company was recently formed with a capital of 15 million roubles under the name of the South Russian Metallurgical Works, and it is understood that Vickers, Ltd., has secured an interest in the new company.

Exports of galvanized sheets have been practically at a standstill, while it is reported that attempts to secure permits since the prohibition of exports have proved so far abortive, due to the steel famine, which, in the case of tin plate, however, has led to a rapid recovery in prices of several shillings per box, since it is inferred that numerous mills will shortly be shut down on account of the great bulk of the steel output being required for munitions. The demand has certainly improved, while makers have entirely withdrawn, pending developments.

Cincinnati

CINCINNATI, OHIO, Aug. 30, 1916.—(*By Wire.*)

Pig Iron.—Following the lead of basic-iron purchasers, foundry and malleable consumers have been very active. In addition to sales made quietly, 1500 tons of Northern foundry iron was sold for first half shipment and the same quantity of Southern iron to a central Ohio melter and several lots of Southern foundry were sold in Indiana and Michigan, where the quantities ranged from 500 to 900 tons. Part of this latter business was taken at $13.50, Birmingham basis, but Southern producers have now withdrawn this quotation and $14 is minimum for strictly furnace iron. Some resale iron is still to be had at the lower figure, but the tonnage is limited and extra charges run the cost above the furnace price. The majority of Southern furnaces are asking $14.50 to $15 for the first half of next year. Northern foundry and malleable are still obtainable at $18, Ironton, and first half contracts have been made at this figure. The stiffening of Southern quotations has enabled Northern producers to reach farther out for business. The activity in malleable was unexpected. One manufacturer in this territory took 1500 to 2000 tons for first half movement, and other smaller sales were made. An Ohio firm is expected to close soon for 10,000 tons and an inquiry for 12,000 tons has been received from outside territory. Lake Superior charcoal iron has also afforded a surprise, recent sales including 2500 tons to a northern Ohio consumer and 500 tons to one in Indiana, with other business pending. In a number of cases the foundries have urged forward shipments of both coke and pig iron in order to forestall, as far as possible, any inconveniences should the threatened railroad strike occur. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$17.40 to $18.40
Southern coke, No. 2 f'dry and 2 soft.	16.90 to 17.90
Southern coke, No. 3 foundry	16.40 to 17.40
Southern coke, No. 4 foundry	15.90 to 16.90
Southern gray forge	15.40 to 16.40
Ohio silvery, 8 per cent silicon	28.26 to 28.76
Southern Ohio coke, No. 1	20.26 to 20.76
Southern Ohio coke, No. 2	19.26 to 19.76
Southern Ohio coke, No. 3	18.76 to 19.26
Southern Ohio malleable Bessemer	19.26 to 19.76
Basic, Northern	19.26 to 19.76
Lake Superior charcoal	21.20 to 22.20
Standard Southern carwheel	24.90 to 25.40

Iron and Industrial Stocks

NEW YORK, Aug. 30, 1916.

It would have been little short of marvelous if the stock market had shown no ill effect resulting from the constantly increasing danger of a strike of the railroad employees. Almost every security is now on a lower level than at the corresponding time last week. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chal., com.	23 - 25¾	Ry. Stl. Spring, com.	45 - 50
Allis-Chal., pref.	78¼ - 79¾	Ry. Stl. Spring, pref.	100¾
Am. Can, com.	58¼ - 62¾	Republic, com.	52 - 55⅛
Am. Can, pref.	111 - 112½	Republic, pref.	113¼ - 114
Am. Car & Fdy., com.	61 - 64½	Sloss, com.	47 - 50¼
Am. Car & Fdy., pref.	117 - 117⅜	Sloss, pref.	96
Am. Loco., com.	75 - 79½	Pipe, com.	19⅞ - 21½
Am. Loco., pref.	105 - 106	Pipe, pref.	53 - 53½
Am. Steel Fdries.	53½ - 57	U. S. Steel, com.	95⅝ - 99⅝
Bald. Loco., com.	76⅝ - 82⅝	U. S. Steel, pref.	117⅝ - 118
Bald. Loco., pref.	104⅝ - 105	Va. I. C. & Coke.	45 - 46
Beth. Steel, com.	476 - 494	Westing. Elec.	58½ - 62
Beth. Steel, pref.	135 - 137	Am. Rad., com.	394 - 395
Case (J. I.), pref.	85	Am. Rad., pref.	132
Colorado Fuel	47¼ - 51½	Am. Ship, com.	49 - 49½
Deere & Co., pref.	91	Chic. Pneu. Tool.	70 - 73
Gen. Electric.	169¾ - 172½	Cambria Steel	82
Gt. No. Ore Cert.	37¼ - 40¼	Lake Sup. Corp.	10⅜ - 11⅛
Int. Harv. of N. J., com.	114¾ - 115	Warwick	9½ - 9⅝
Int. Harv. Corp., com.	78 - 79	Cruc. Steel, com.	74¼ - 79½
Int. Harv. Corp., pref.	108¼ - 108¾	Cruc. Steel, pref.	117¾ - 118
Lacka. Steel	75½ - 79¼	Harb.-Walk. Refrac., com.	101½
Nat. En. & Stm., com.	23⅞ - 25⅝	La Belle Iron, com.	56½ - 59
N. Y. Air Brake.	136½ - 139⅞	La Belle Iron, pref.	133 - 133½
Pitts. Steel, pref.	98½ - 99½	Carbon Stl., com.	70½ - 74½
Pressed Stl., com.	52 - 55⅝	Driggs-Seabury	85 - 98
Pressed Stl., pref.	101	Midvale Steel	62½ - 65

Dividends

The Railway Steel Spring Company, regular quarterly, 1¾ per cent on the preferred stock, payable Sept. 20. No action was taken by the directors on common dividend.

The La Belle Iron Works, regular quarterly, 2 per cent, and an extra of 2½ per cent on deferred dividends on the preferred stock, reducing the amount of the latter to 2½ per cent.

The Standard Screw Company has called for redemption on Oct. 1 next all its outstanding 5 per cent gold debenture bonds. There are $240,000 of these bonds yet outstanding, the rest of the original issue of $600,000 having been retired under provisions of the mortgage. The bonds are redeemable at par and interest. Interest will cease to accrue after Oct. 1.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, effective from April 10, 1916, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c.; Pacific coast (by rail only), 65c.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 2.60c. to 2.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 3c. to 4c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

	Cents per lb.
Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in. over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over	
Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft. to 2 ft. inclusive	.55
Circles under 2 ft. to 1 ft. inclusive	.80
Circles under 1 ft.	1.85

Half circles take circle extras.
Sketches, not over four straight cuts, inc. straight taper .10
Sketches having more than four straight cuts .20
Plates sheared to a radius take complete circle extras.

*Including extra for width.

Wire Rods.—Including chain rods, $55 to $60.

Wire Products.—Prices to jobbers effective Aug. 5: Fence wire, Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $2.55; galvanized, $3.25. Galvanized barb wire and staples, $3.45; painted, $2.75. Wire nails, $2.60. Galvanized nails, 1 in. and longer, $2 advance over base price; shorter than 1 in., $2.50 advance over base price. Cement-coated nails, $2.50. Woven wire fencing, 61½ per cent off list for carloads, 60½ off for 1000-rod lots, 59½ off for less than 1000-rod lots.

The following table gives the price per 100 lb. to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	6 to 9	10	11	12&12½	13	14	15	16
Annealed	$2.60	$2.65	$2.70	$2.75	$2.85	$2.95	$3.05	$3.15
Galvanized	3.30	3.35	3.40	3.45	3.55	3.65	4.10	4.20

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect on black pipe from April 21, 1916, and on galvanized pipe from July 24, 1916, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	63	35½	⅛ and ¼	52	24
½	67	51½	⅜	53	25
¾ to 3	70	55½	½	57	38
			¾ to 1½	60	43

Lap Weld

2	65	50½	1¼	48	31
2½ to 6	68	53½	1½	54	38
7 to 12	65	49½	2	55	39
13 and 14	63½	..	2½ to 4	57	42
15	51	..	4½ to 6	57	42
			7 to 12	56	41

Reamed and Drifted

1 to 3, butt	68	53½	¾ to 1½, butt	55	37
2, lap	63	48½	1¼, lap	43	25
2½ to 6, lap	66	51½	1½, lap	49	32
			2, lap	50	33
			2½ to 4, lap	52	36

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	59	40½	⅛, ¼ and ⅜	52	34
½	64	50½	½	57	43
¾ to 1½	68	54½	¾ to 1½	61	45
2 to 3	69	55½			

Lap Weld, extra strong, plain ends

2	63	49½	1¼	50	33
2½ to 4	66	52½	1½	55	39
4½ to 6	65	51½	2	57	42
7 to 8	61	45½	2½ to 4	59	45
9 to 12	56	40½	4½ to 6	58	44
			7 to 8	52	38
			9 to 12	47	33

Butt Weld, double extra strong, plain ends

½	55	43½	½	44	31
¾ to 1½	58	46½	¾ to 1½	47	34
2 to 2½	60	48½			

Lap Weld, double extra strong, plain ends

2	55	43½	1½	44	30
2½ to 4	57	45½	2	44	30
4½ to 6	56	44½	2½ to 4	46	35
7 to 8	51	35½	4½ to 6	45	34

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	2.95 to 3.20
Nos. 9 and 10	3.00 to 3.25
Nos. 11 and 12	3.05 to 3.30
Nos. 13 and 14	3.10 to 3.35
Nos. 15 and 16	3.20 to 3.45

Box Annealed Sheets, Cold Rolled

Nos. 17 to 21	2.70 to 2.85
Nos. 22 and 24	2.75 to 2.90
Nos. 25 and 26	2.80 to 2.95
No. 27	2.85 to 3.00
No. 28	2.90 to 3.05
No. 29	2.95 to 3.10
No. 30	3.15 to 3.30

Galvanized Sheets of Black Sheet Gage

Nos. 10 and 11	3.15 to 3.25
No. 12	3.25 to 3.35
Nos. 13 and 14	3.25 to 3.35
Nos. 15 and 16	3.35 to 3.45
Nos. 17 to 21	3.50 to 3.60
Nos. 22 and 24	3.60 to 3.70
Nos. 25 and 26	3.75 to 3.85
No. 27	4.00 to 4.10
No. 28	4.15 to 4.25
No. 29	4.30 to 4.40

Boiler Tubes.—Discounts on less than carloads, freight to destination added, effective from April 15, 1916, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1½ in.	35	1½ in.	27
1¾ and 2 in.	47	1¾ and 2 in.	39
2¼ in.	44	2¼ in.	36
2½ and 2¾ in.	50	2½ and 2¾ in.	42
3 and 3¼ in.	55	3 and 3¼ in.	47
3½ to 4½ in.	56	3½ to 4½ in.	48
5 and 6 in.	49	5 and 6 in.	41
7 to 13 in.	46	7 to 13 in.	38

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Aug.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
23	27.25	27.00	38.37½	6.65	6.50	9.50	9.25
24	27.25	27.00	38.50	6.70	6.50	9.37½	9.12½
25	27.37½	27.12½	38.62½	6.70	6.50	9.37½	9.12½
26	27.37½	27.12½	.....	6.70	6.50	9.25	9.00
28	27.50	27.25	39.25	6.60	6.50	9.00	8.75
29	27.50	27.25	39.25	6.50	6.50	9.00	8.75

NEW YORK, Aug. 30, 1916.

The undertone of copper is strong and prices are higher, although buying is more moderate. Tin has advanced, despite no great activity. Lead is less active and lower. Spelter is dull and lower. Antimony is quiet again, but with the nominal quotation unchanged.

New York

Copper.—Prompt metal is scarce and is again classed as a specialty, with spot electrolytic commanding 28c. or over. October, November and December electrolytic can be had around 27.25c. and first quarter at about 26.50c. Lake, for last quarter delivery, is about 27.50c., cash, New York. First hands continue to report buying of forward positions, but the activity is becoming more moderate. The metal in every particular is in a strong position. The refineries are behind in deliveries because of the recent heat and mechanical troubles, and the development of any considerable demand at this time would send prices upward quickly. The London market is stronger at £129 for electrolytic, against £127 a week ago. The exports this month, including yesterday, total 27,635 tons.

Tin.—The week as a whole has been quiet, although on Aug. 24 and again on Aug. 28 there were fair sales. On the first date mentioned the market appeared inanimate on the surface, but very quietly there was some fair buying of Banca for spot delivery and Straits from the East. On Aug. 28 the buying was restricted to a few buyers, most of whom were apparently seeking metal wherewith to cover old contracts. Yesterday the market was quiet at 39.25c. for spot Straits, but consumers showed no interest. The arrivals up to yesterday total 3617 tons and there was afloat 3235 tons.

Lead.—This metal has become more settled and independents have lowered their quotation to the level of the leading interest, 6.50c., New York. At St. Louis, however, they are asking more than the principal producer, inasmuch as they quote 6.50c. there also, although the big seller asks but 6.42½c. For a time, when the independent quotations were as high as 6.75c. and a sale was made even at 6.80c., New York, the leading interest was not selling. Since then it has resumed, but it is understood that it will contract only with regular customers and for limited quantities. The exports continue light, those of the month, including yesterday, amounting to 797 tons.

Spelter.—The market has become quiet again, and with the falling off of interest on the part of buyers prices have declined steadily. The New York quotations for spot metal are now 9c. to 9.25c., and at St. Louis 8.75c. to 9c. Fourth quarter can be done at 8.50c. to 8.75c., St. Louis. The chief demand continues to come from abroad. Producers have a great deal of faith in the future. Some of the more important ones are well sold up to the end of the year, especially on prime Western. This month a large quantity of high-grade metal has been taken, both for export and by the brass mills. It is generally believed that the market would be much stronger were it not for the unsteadiness of some of the smaller producers, who soon become worried whenever buying subsides and seek to arouse action by offering concessions. Sheet brass continues difficult to get for delivery this year. The principal maker is understood to be selling at 37c. to 38c. to its regular customers, but outsiders have to pay 40c. Sheet zinc in carload lots is unchanged at 15c. per pound.

Antimony.—The heavy buying reported a week ago has entirely subsided and it is probable that the quotation usually made, 13.50c., could be shaded about ½c. per pound.

Aluminum.—Quotations are stronger at 59c. to 61c. for No. 1 virgin aluminum, 98 to 99 per cent pure, but the market is quiet.

Chicago

AUG. 28.—Activity among purchasers of copper continues and market quotations show a sustained firmness. Tin is in better demand, particularly for future delivery. Spelter quotations are again lower. Prices for scrap metals have advanced sharply. We quote: Casting copper, 26c.; Lake copper, 28c.; tin, carloads, 39.75c. to 40c., and small lots, 41c.; lead, 6.65c. to 6.75c.; spelter, 9c.; sheet zinc, 15c.; Cookson's antimony, 50c.; other grades, 14.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 19.50c.; copper bottoms, 17.75c.; copper clips, 18.50c.; red brass, 17c.; yellow brass, 13c.; lead pipe, 5.25c.; zinc, 6c.; pewter, No. 1, 28c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUG. 28.—Metals have been quiet, closing to-day as follows: Lead firm, 6.65c. to 6.75c.; spelter, dull and weak, 9.25c. to 9.50c.; tin, 40c. to 41c.; Lake copper, 27.50c. to 28c.; electrolytic copper, 28c. to 28.50c.; antimony, 14c. to 15c. In the Joplin ore district zinc blende was held at a top price of $70 per ton, with the average for the week $61. The average for August has been $58.75 against $66.30 for July. Calamine ranged from $35 to $45, with the average for the week $41. Lead ore was firm at $65 for 80 per cent metal. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 8c.; heavy yellow brass, 11c.; heavy red brass and light copper, 15c.; heavy copper and copper wire, 17c.; lead, 5c.; zinc, 5c.; tea lead, 3.50c.; pewter, 25c.; tinfoil, 30c.

Orders for Locomotives

Orders for locomotives in recent weeks, mostly in August, have amounted to about 175. The American Locomotive Company will furnish 60 consolidated locomotives to the Italian State Railways, 15 locomotives to the Northern Railway of Spain, 9 mogul locomotives to the Russian Government, 10 locomotives to the Pittsburgh & Lake Erie, and 5 Pacifics to both the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis. The British Government has placed an order for 45 narrow-gage locomotives with the Baldwin Locomotive Works and the New York Central has purchased 10 electric engines from the General Electric Company.

Large Sulphuric Acid Exports

Sulphuric acid exports in June were 9,421,735 lb., which is next to the largest month's total this year, the March exports having been 12,979,267 lb. This brings the total for the half year to 43,739,427 lb., or 7,289,903 lb. per month. For the fiscal year ended June 30, 1916, the total exports were 82,020,246 lb., against 46,771,510 lb. and 12,131,750 lb. for the fiscal years 1915 and 1914 respectively. The June exports were nearly equal to the total for 1913, of 9,689,005 lb., while the March exports were very little short of the 13,176,175 lb. exported in 1914.

The Brennan Engineering Company, Delaware Building, 36 West Randolph Street, Chicago, announces that on Aug. 1 the business was incorporated under the name of Brennan Wahl Company. It will conduct a business as consulting engineer—mechanical, structural and chemical—also as manufacturers' sales and purchasing agent for machinery and allied products. Daniel A. Brennan is president; Andrew G. Schneider, vice-president, and Henry R. Wahl, secretary-treasurer.

Customs Decisions

COPPER IN FLAKES, CALLED "SCHROT"

The general board has declined to take favorable action on a protest filed by George Benda, New York, relating to the classification under the tariff of so-called copper "schrot," consisting of copper in the form of small flakes produced by various manufacturing processes and intended to be converted into bronze powder. It appeared from the testimony that the flakes or clippings are cut from new copper. The collector took duty at 20 per cent as manufactures of metal not specially provided for, while the importer claimed free entry under that section of paragraph 461 reading "clippings from new copper." The board held that it was clearly the intent of Congress to admit free of duty copper which may virtually be said to be in the form of raw material, that is, copper which as imported shows that it still has to receive the first stages of manufacturing before it is even susceptible of being converted into manufactured articles. As against this intent, the board's decision said the customs tribunal was fully satisfied that the copper "schrot" was an article so far advanced in condition through manufacturing processes that all that remained to be done in order to convert it into its ultimate use as bronze powder was to further hammer or stamp it into a fine powder. The protest was accordingly overruled and the collector affirmed.

EMBROIDERY MACHINES DEFINED

According to a decision of the Board of United States General Appraisers, the provision in the present tariff law for "embroidery machines" cannot be stretched to include machines of other varieties even if the latter perform some of the functions of embroidery machines. The case enunciating this principle was that of the Robert Reiner Company, New York, the importations consisting of paper punching machines. The appraiser of the port made a report to the board in which he stated that the merchandise consisted of "13-needle embroidery machines, and card punching attachments for cutting out the designs of patterns." Duty was levied at the rate of 25 per cent under the provision in paragraph 165 of the act of 1913 for "embroidery machines." The importers asked a rate of 20 per cent under that section of paragraph 167 specifying "manufactures of metal not specially provided for."

The chief witness appearing at the trial was Robert Reiner, president of the importing company. His testimony showed that he had been for 18 years a dealer in embroidery machines; that his corporation at the present time is the largest dealer in that class of machines in the United States; that the machines under consideration are not embroidery machines but what are known as paper punching machines. The witness went on to testify that the sole purpose for which they were designed, and for which they are employed in the commerce of this country, is to punch holes, according to the pattern and design outlined in pencil or otherwise, in specially prepared paper rolls required for subsequent use in embroidery machines. Another point brought out was that, as a guide or check upon the accuracy of the work performed by the operator in punching the holes in conformity with the design or pattern desired, there is produced, simultaneously with the punching operation, a piece of embroidery measuring 13 in. in length showing the same pattern or design which has been punched through on the paper roll. It also appeared that the part of the machine which contains the mechanism for turning out this piece of embroidery comprises but one-tenth of the whole machine, whereas the part devoted to punching through the design upon the paper roll constitutes nine-tenths of the machine.

Counsel for the Government contended on the other hand "that the machines in question are embroidery machines, first, because they actually embroider pieces of cloth, and, second, because their other work, the punching of the paper roll, is a necessary preliminary process in the production of other pieces of embroidery in large commercial sizes on automatic embroidery machines."

Judge Fischer, in his decision approved by the other members of the board, commenting on the Government counsel's plea said in part:

"The record fully confutes the first contention, while the reasoning advanced in support of the second would be as clearly unsound and untenable in practice as it is novel and extraordinary in theory. If a machine which is employed to make parts or attachments intended for use on an automatic embroidery machine itself becomes, by reason of the nature of its product, an embroidery machine and so classifiable for tariff purposes, then for the same reason and with the same sense of propriety should a machine which cuts the rolls used in automatic player-pianos be itself treated as an automatic player-piano; the machine which makes graphophone disks as a graphophone; a typesetting machine as a printing press, and a typewriting machine which cuts the stencils used in mimeograph work be considered a mimeograph machine. That the machine in question is clearly not an embroidery machine within the meaning of the law is conclusively proved of record. * * * The embroidery work it performs has no commercial value as such and is purely incidental and secondary to the card punching function of the machine. The protests are accordingly sustained and the decisions of the collector reversed."

Welding at the Electrical Exposition

Electric welding of iron and steel will be one of the feature exhibits of the New York Electrical Exposition, which will be held in Grand Central Palace, New York, Oct. 11 to 21. This exhibit is important from an educational standpoint, for the general public is surprisingly uninformed on this now highly developed process in the iron and steel industry.

The exhibit is being arranged by the Arc Welding Machine Company, 220 West Forty-second Street, New York, and O. A. Kenyon will be in charge. The public will have an opportunity of seeing all grades of welding accomplished in iron and steel, including structural pieces, plates and castings. Two arcs will be in operation equipped with automatic control so that the metal cannot burn by drawing too long an arc. The length of the arc is automatically controlled so that even the most unskilled worker cannot draw it beyond the point set. A special type of self-regulating generator, designed particularly for welding purposes, will be used. It consists of three units, one of which supplies the power, another regulates for constant current, and a third takes care of the adjustment. This generator is used exclusively by the Arc Welding Machine Company. The United States Government is co-operating in the exposition through the War, Navy and Commerce departments, all of which will have comprehensive exhibits.

Inland Steel Company Starts New Open-Hearth Furnaces

The Inland Steel Company on Friday, Aug. 25, placed in operation the first two of its new battery of eight 75-ton open-hearth furnaces at Indiana Harbor, Ind. The additional furnaces will be started next week. The company has been handicapped by a shortage of steel for its finishing capacity, but the output from these four furnaces will more than supply the deficiency and the company is understood to have made some sales of ingots. The completion of the remaining four furnaces will be timed to the progress in completing the new finishing mills which the company has under construction. The new open hearths in operation will absorb all of the hot metal production of the company's two blast furnaces and in addition some of the accumulation of iron that has been stored in anticipation. A third blast furnace is now under construction to provide for the open-hearth furnaces still to be finished.

The Michigan Bolt & Nut Works, Detroit, Mich., has a profit-sharing plan of the bonus type. The labor in the plant includes many foreigners. The company co-operates with the plan inaugurated by the Detroit Board of Commerce for the Americanization of such workmen. It encourages its men to attend night school, keeps check on their attendance and progress, and rewards proficiency in learning English and advancing in general education by promotion to better jobs.

PERSONAL

Henry R. Cobleigh, formerly mechanical editor of THE IRON AGE, and latterly managing editor of *Power*, has established himself in business as a partner in the Power Plant Management Company, National Bank of Commerce Building, New York. A specialty is made of effecting operating economies in power generation and distribution in existing industrial and other plants.

In addition to the appointments announced last week by the American Steel & Wire Company, the following have been made: C. R. Putnam, formerly superintendent of the Waukegan, Ill., wire works, has been appointed superintendent of the North Works, Worcester, Mass., succeeding G. W. Sells, who was made assistant manager of the Chicago District. W. E. Acomb, formerly superintendent of the Donora, Pa., wire works, has been appointed superintendent of the Waukegan wire works, succeeding Mr. Putnam. August Mann, formerly superintendent of the Farrell, Pa., works, has been appointed superintendent of the Donora wire works, succeeding Mr. Acomb. John Aurelius, formerly assistant superintendent of the Newburg, Ohio, wire works, has been appointed superintendent of the Farrell works, succeeding Mr. Mann. F. E. Gage, who was formerly assistant superintendent of the Rankin, Pa., works, has been appointed assistant superintendent of the Donora works, instead of superintendent as reported.

J. M. Brussell, who has been with the Ferro Machine & Foundry Company, Cleveland, as general superintendent for several years, has resigned to accept a similar position with the Delco Company, Dayton, Ohio.

William L. Diemer, Jr., has purchased the controlling interest in the National Wheel Company, Perrysburg, Ohio, maker of baby carriages and other vehicles for children, and has assumed the management of that company, having resigned as secretary of the Gendron Wheel Company, Toledo, with which he had been connected twenty-three years.

E. T. Foote, formerly of the New York office of the Cutler-Hammer Mfg. Company, and at one time in the engineering department at its Milwaukee factory, has recently been put in charge of the Boston office, located in the Columbian Life Building.

R. D. Chapman has been appointed general sales manager of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J.; William Wharton, Jr., & Co., Inc., Easton, Pa., and the Tioga Steel & Iron Company, Philadelphia.

C. B. Andrews has been appointed sales manager of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J.

Julean A. Arnold, American commercial attaché at Peking, China, has returned to the United States after a two years' stay in the Far East. He may be communicated with through the Department of Commerce.

W. S. Stothoff has been appointed general superintendent of Wm. Wharton, Jr., & Co., Inc., Easton, Pa., and the Tioga Steel & Iron Company, Philadelphia, Pa., in charge of plants and manufacturing. He was formerly in charge of sales of the Taylor-Wharton Iron & Steel Company, the parent company, at High Bridge, N. J.

Frank A. Moeschl, general manager of sales, Newport Rolling Mill Company, Newport, Ky., is spending his vacation on the Pacific coast.

A. N. Flora, general superintendent in charge of works operations of the Trumbull Steel Company, Warren, Ohio, for several years, has been made general manager of sales.

L. Meyrick, formerly of the Lavine Gear Company, Racine, Wis., has accepted the position of general superintendent of the Ferro Machine & Foundry Company, Cleveland.

Royal C. Wise, sales engineer, has removed his office from 9 South Clinton Street to 540 Monadnock Block, Chicago.

Arthur H. Halloran, vice-president and managing editor of the *Journal of Electricity, Power and Gas*, has been appointed Pacific coast representative of the Society for Electrical Development, with headquarters in the Crossley Building, San Francisco.

U. S. James of the Gisholt Machine Company sailed Aug. 26 on the Christianafjord for Christiana, Norway, to join C. H. Johnson, European representative of the company at Petrograd.

Iroquois Iron Company to Make Bessemer Steel

As already announced, the plans of the Mark Mfg. Company for its new Indiana Harbor, Ind., plant contemplated the installation of a Bessemer converter at once and in the future the erection of a blast furnace. It was expected that the metal for the converter would be furnished by the Iroquois Iron Company, whose interests are closely affiliated. The transfer of hot metal in the Chicago switching district has never been found feasible, and a revision of plans now provides for the erection of the converter by the Iroquois Iron Company on its own property and the delivery of ingots to the Mark Mfg. Company. The latter will delay building its own converter until such time as it builds blast furnace capacity. The Iroquois Iron Company, by rushing the completion of this 15-ton converter and a 1000-ton mixer, should be in position to take advantage of current demand for ingots in the period preceding the completion of the Mark finishing mills. Other improvements of the Iroquois Iron Company include a pig casting machine, to be erected at once, and an additional blast furnace and a by-product coke plant later.

Heroult Furnace Installations

The United States Steel Corporation has granted licenses for the installation of four more Heroult electric steel furnaces as follows:

The Warren Steel Casting Company, St. Louis, Mo., will erect a 2-ton furnace for making steel castings.

The Alabama Power Company, Anniston, Ala., has purchased three more 6-ton furnaces for making munition and high grade steels. These are in addition to the two 3-ton furnaces already operating and the 3-ton now being built. The company will have six 6-ton furnaces when these new installations are completed.

These four furnaces bring the number of Heroult furnaces in operation or contracted for in the United States and Canada to 76. On Jan. 1, 1916, the number was 43, so that the rate of increase this year has been more rapid than ever before.

The Cutler-Hammer Mfg. Company, Milwaukee, is acquainting the people at large with the advantages of its C-H push socket by means of a nation-wide publicity campaign, designed to reach the millions who use lamp sockets in their residences, stores, offices and factories. This campaign, while planned some time ago, was held up until the accomplishment of a perfect trade distribution of the sockets in all parts of the country, so that the company as well as those handling or installing C-H sockets would receive the fullest benefit from the campaign from its very start. The capacity for turning them out has been doubled twice in the past two years.

It is estimated that 20 leading copper companies, operating in the United States, Canada and South America, produced approximately 895,000,000 lb. of copper in the first half of 1916. This is an increase of 299,000,000 lb., or 50 per cent, over the same period in 1915.

The Ellis-Smith Mfg. Company, Inc., will hereafter be the name of the Rub-On Mfg. Company, Inc., 87 Brayton Street, Buffalo, N. Y. The older name no longer describes the business, which covers the manufacture of automobile turn-table jacks, towing trucks and valve-reseating tools.

Britain's Great Increase in Munitions

Characterizing as an industrial miracle the work that had been done in Great Britain since the war began, in increasing the output of war munitions, F. Kellaway of the Ministry of Munitions in a recent speech said:

"Of the 4000 controlled firms now producing munitions 95 per cent had never produced a gun, shell or cartridge before the war. In 10 months they produced more shells than all the government arsenals and great armament shops existing at the outbreak of the war; and that was only a very small percentage of the total weekly production of shells in the country. Ninety arsenals had been built or adapted, and all except a very few were producing heavy guns, howitzers, big shells, or explosives, but we were not yet at the full flood of the output of guns and shell. There were 184,000 women engaged in war industries in 1914. To-day there are over 660,000. The total number of war workers in 1914 was 1,986,000; now it is 3,500,000. Women are engaged on 471 different munition processes, including 19 operations in connection with aeroplane production, the manufacture of howitzer bombs, the making of shrapnel bullets, filling bombs with smoke, explosives, gas, and other lethal contents; 31 processes on the production of machine tools; 6 processes in connection with marine mines; and 31 processes in shipbuilding. Two-thirds of these operations had never been done by a woman previous to 12 months ago. The Ministry of Munitions has built or is building housing accommodation for 60,000 workers, and canteens and mess rooms in munition works now give accommodation for meals for 500,000 workers a day."

American Porcelains

One field in which Germany has been pre-eminent is that of porcelain for chemical work. The Prussian product has heretofore never been equaled. Royal Berlin porcelain has been the standard of high quality. To make this, the Prussian manufacturer has had to import clays from different countries because of certain peculiar qualities necessary. When our supply of German porcelain was cut off with the outbreak of war in Europe, our chemical industries, and especially our chemical laboratories, were hard hit. To-day, however, American pottery manufacturers are producing in their own works, through their own skill and ingenuity, porcelains the equal of any produced in Germany. This is one of the achievements of American chemistry which will be demonstrated during Chemical Week at the Chemical Exposition in New York, Sept. 25 to 30.

Manganese Ore and Ferromanganese Imports

Manganese ore imports into the United States in June were 58,143 gross tons, against 74,875 tons in May. This brings the total for the half year to 232,926 tons, or 38,821 tons per month, which exceeds the monthly rate of 26,731 tons in 1915 and 28,757 tons in 1913, the record year. For the fiscal year ended June 30, 1916, the total imports have been 492,860 tons, against 206,859 tons and 288,706 tons for the same fiscal years of 1915 and 1914 respectively.

Ferromanganese imports for the first quarter of 1916, from Government data just published, were 19,752 gross tons, against 14,400 tons and 20,421 tons for the two preceding quarters.

The board of directors of the Mansfield Sheet & Tin Plate Company, Mansfield, Ohio, has decided to recommend an increase in the capital stock to $1,000,000 and to double the capacity of the plant. A special meeting of the stockholders will be held Sept. 3 to secure the formal ratification of the proposed extensions.

The Samuel Garber & Son Company has purchased the entire interests of Schulman & Garber, dealers in scrap iron, steel, metals, etc., Minneapolis, Minn. The yards and warehouses are on the Chicago, Milwaukee & St. Paul Railroad tracks and Tenth Avenue, South, and the office is at 1018 South Fourth Street.

OBITUARY

DANIEL MORRELL, the principal founder and former secretary of the Hartford Machine Screw Company, died in Hartford, Conn., Aug. 22, aged 80 years. He was born in Canajoharie, N. Y. In 1857 he entered the employ of David Groesbeck & Co., bankers and brokers, New York City, and rose to a partnership. In 1860 he was made a member of the New York Stock Exchange, retaining his seat for nearly 30 years. He became interested in the early automatic screw machine invented by Christopher M. Spencer of Hartford and by his liberal financial aid in the experimental stage made possible its later commercial success. He was also interested in the Johns-Pratt Company, Hartford, and several other industries. When the Hartford Machine Screw Company was sold to Western interests in 1907, Mr. Morrell retired from active participation in business.

JOHN NOEY, for 42 years superintendent of motive power and boilers at the Edgar Thomson works of the Carnegie Steel Company, died in Mercy Hospital, Pittsburgh, Aug. 23, aged 66 years. He was one of the oldest department superintendents at the Edgar Thomson Works, and in the old days was one of the "junior partners" of Andrew Carnegie. He was born in Johnstown, Pa., for some years was employed by the Cambria Steel Company, and in 1874 went with the late Capt. William R. Jones to help build the Edgar Thomson Works.

CHARLES L. THOMPSON, assistant to J. W. Deetrick, general superintendent of the Republic Iron & Steel Company, died suddenly at his home in Youngstown, Ohio, Aug. 27, aged 52 years. He was born in Aurora, Portage County, Ohio, and for many years was in the service of the Erie Railroad at Youngstown. Later he was with Cartright, McCurdy & Co., whose plant was taken over by the Carnegie Steel Company, and he then became identified with the Republic Company. He leaves his widow, a daughter and a son.

EMIL HERTER, chief mechanical engineer of the Edison Storage Battery Company, West Orange, N. J., died at the Orange Memorial Hospital, Aug. 26, aged 59 years. He was associated with Thomas A. Edison for some 30 years. He was a member of the American Society of Mechanical Engineers.

ROBERT MCCLEAN, member of the firm of A. McClean & Co., iron and metal dealers, Baltimore, Md., died Aug. 24 at a local hospital, aged 61 years. He was a native of Baltimore.

STANLEY O. AITKENS, assistant traffic manager for the American Steel & Wire Company, Worcester, Mass., died Aug. 16 from infantile paralysis, aged 22 years.

ERNST A. EVERSMAN, president Perfection Furnace Pipe Company, Toledo, Ohio, died Aug. 18.

Navy Department Adopts Geared Turbines for Destroyers

Geared turbine units are to replace the direct connected turbines of the destroyers Henley and Mayrant. Contracts for this work have been placed with the Westinghouse Machine Company, East Pittsburgh. The Navy Department has adopted geared turbines, it is understood, because they are lighter and take up less space than direct-connected units, are better mechanically because of their small size, and require less steam consumption at all speeds and especially at cruising speeds. This of course reduces the fuel consumption and increases the steaming radius, which is an important feature. The machinery to be supplied by the Westinghouse Machine Company, will consist of two complete-expansion geared-turbine units of the impulse-reaction type with Kingsbury thrust bearings, and two geared cruising units. It is to be installed in the same engine room space and to connect with the existing propeller shafting, and drive the propellers at the same speed as formerly.

Pittsburgh and Nearby Districts

Reports are that Eastern parties are trying to secure control of the plant of the LaBelle Iron Works, Steubenville, Ohio. The company has two blast furnaces, with a capacity of about 800 tons of iron per day; an open-hearth steel plant containing 11 furnaces, together with plate and sheet mills and a cut nail factory. The last named is located at Wheeling, W. Va. The LaBelle Iron Works also controls the Pitt Iron Mining Company, which operates the Miller and Wacootah mines in Minnesota; it owns the capital stock of the LaBelle Coke Company, which has 325 acres of coal lands and 200 beehive coke ovens in Fayette County, Pa.; it owns coal lands in Jefferson County, Ohio, and Brooke County, W. Va., and controls the LaBelle Steamship Company, having one Lake ore steamer with a carrying capacity of 10,000 tons.

The tar product of the new Koppers by-product coke plant of the Youngstown Sheet & Tube Company, all the 204 ovens of which are now in operation, will be sold direct to the Barrett Mfg. Company, which has erected a new plant at Youngstown, and it will also act as selling agent for the other by-products, such as benzol, toluol, phenol, etc. Gas from the by-product coke ovens is now being used in the 18-in. bar mill, replacing natural gas.

Salaried employees of the Youngstown Sheet & Tube Company will participate in a semi-annual bonus, to be paid Aug. 31, for the first six months of 1916. On Sept. 7 the mill employees will participate in a bonus for the first four months of this year, at a rate of 10 per cent. The bonus plan was dispensed with May 1 for the mill hands because of extra earnings received by reason of the prosperous trade conditions.

The Republic Iron & Steel Company, Youngstown, has put its new small tube mill in operation, making sizes from ¼ to 2½ in. It is expected to get the large mill on within the next four weeks, making from 8 to 16 in. The installation was made by the United Engineering & Foundry Company. With the two new mills in operation the capacity of the Republic tube plant will be increased 50 per cent.

The Sharpsville Boiler Works, Sharpsville, Pa., has been reorganized with a capital of $50,000 and will erect a new building, 120 x 170 ft., for heavy plate construction work. Officers have been elected as follows: Hugh Garvey, Sharon, president; Charles B. Fagan, Pittsburgh, secretary; Frank J. King, Sharpsville, treasurer; J. P. Keene, Pittsburgh, general manager; W. C. McGraffic, Pittsburgh, superintendent, and C. R. Vogel, also Pittsburgh, auditor. The company is said to have orders booked ahead for eight months.

The Fawcus Machine Company, Pittsburgh, maker of cut gears, has opened a downtown office in room 1905, First National Bank Building.

The Republic Iron & Steel Company has posted notices in its works announcing that it will pay monthly prizes to employees offering the best suggestions for improvements in plant operations. The prizes will be $25, $15, $10 and $5. A committee composed of heads of departments will judge as to the worth of suggestions submitted.

Stockholders of the Petroleum Iron Works Company and its two allied interests, the Pennsylvania Tank Car Company and the Pressed Steel Products Company, held annual meetings at Sharon, Pa., Aug. 24. Officers' reports submitted showed that all three are in prosperous condition, and have orders booked ahead for some months. Officers were elected as follows: Petroleum Iron Works Company—George P. Bard, president; John L. Considine, vice-president; A. S. Maitland, treasurer; H. C. Knowles, secretary and assistant treasurer. Pennsylvania Tank Car Company—L. S. Jordan, president; John L. Considine, vice-president; A. S. Maitland, treasurer; H. C. Knowles, secretary and assistant treasurer. Pressed Steel Products Company—John L. Considine, president; E. E. Mytinger, vice-president; A. S. Maitland, treasurer; H. C. Knowles, secretary and assistant treasurer.

The Roanoke Steel Company, Inc., which recently took over the plant of the Louks Iron & Steel Company at Roanoke, Va., has put it in operation, turning out about 50 tons of merchant iron bars per day. It is the intention to add to the equipment and increase the capacity to 100 tons per day of high grade iron bars and other products.

The Beaver Refrigerator Company, New Brighton, Pa., has let a contract for the erection of a new plant, 100 x 250 ft.

Robert W. Tener, for 21 years, and W. E. Troutman, for 12 years, with the United Engineering & Foundry Company, Pittsburgh, have purchased the plant of the Braddock Machine & Mfg. Company, Braddock, Pa., near Pittsburgh, and will make a specialty of producing acid open-hearth ingots, turning out about 1200 tons per month. The present machine-tool department of the plant will also be operated.

The plant of the Pittsburgh Sheet & Tin Plate Company at Marietta, Ohio, has been put in operation. Owners of the plant, formerly controlled by Eastern capitalists, plan to install six additional mills, which will give the company a total of 10 mills for rolling tin plate and tin-mill sizes of black sheets. Larkin C. Taylor, president Baird Machinery Company, Pittsburgh, is head of the Pittsburgh Sheet & Tin Plate Company; E. Cooper Shapley, Commonwealth Trust Company, is vice-president; M. J. Richards, formerly superintendent of the Standard Tin Plate Company, Canonsburg, Pa., is general manager. It is stated that about $500,000 will be spent for extensions and improvements.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received an order from the Boston & Maine Railroad for two 130-ton Baldwin-Westinghouse electric locomotives, similar to those now in service. It has also recently sold to the Montana Power Company complete electrical equipment for the operation of a hydroelectric station on the Missouri River at Holten, Mont. The equipment includes four 12,000-kva. waterwheel generators, two 500-kw. waterwheel exciters, four 12,000-kva. transformers with a maximum continuous rating of 16,000 kva., switching equipment for the entire station, battery charging motor-generator sets, air compressors, testing set, oil filter, etc.

The Lovell Mfg. Company, Erie, Pa., is erecting a small addition to its plant. No additional machinery will be required.

The board of water commissioners of Erie, Pa., has awarded contract for a new 20,000,000-gal. turbine-driven pumping engine to the De Leval Pump Company, Trenton, N. J. Alliance, Ohio, has employed Chester & Fleming, hydraulic and sanitary engineers, Pittsburgh, to prepare detailed plans and specifications for additional pumping machinery, rebuilding pumping station and a new concrete-covered reservoir. A bond issue of $150,000 has been sold for these improvements, and the work will be advertised as soon as plans are finished.

The plant of the Best Foundry Company, New Kensington, Pa., was sold at sheriff's sale Aug. 25 to the American Manganese Mfg. Company, Philadelphia. The foundry is equipped with a 60-in. cupola and made gray-iron castings up to 10 tons in weight, with a capacity of about 20 tons per day. A machine shop is attached. It is not known whether the purchaser will operate the plant.

The Pullman Car Company, Chicago, denies the report that it will shortly begin the erection of a branch plant at Mingo Junction, Ohio, for the manufacture of steel cars. It is improving its plant at Pullman, Ill.

As part of the program of improvements at its Steelton, Pa., works, as recently announced, the Bethlehem Steel Company has let contracts for the erection of a 500-ton blast furnace to be known as A stack. The Raymond Concrete Pile Company, New York, will build the foundations and the structural steel and erection work will be done by the Bethlehem construction department.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

LEGAL PROTECTION AGAINST COPYING OF DEVICES.—A manufacturer, having achieved a valuable reputation as the producer of a certain unpatented device, is entitled to enjoin a competitor from copying the appearance of the article to the confusion of buyers. And when the public buys a part to replace one in a machine (in this case, spark plugs for automobiles) the fact that the imitating device is sold in a carton dissimilar from those used by the manufacturer of the original part will not avoid a finding of unfair competition, since a buyer of a machine originally equipped with the complaining manufacturer's part would not be familiar with that manufacturer's distinguishing carton. But when it appears that the questions involved in such a controversy arise out of honest trade differences, a decree in favor of the complaining manufacturer may be conditioned on his refraining from advertising the decree in such a manner as to interfere with defendant's future trade. (United States District Court, Southern District of New York, Champion Spark Plug Company vs. A. R. Mosler & Co., 233 Federal Reporter, 112.)

A SAFEGUARD AGAINST FREIGHT REBATES.—When a railroad company sues to recover freight charges on an interstate shipment, the defendant will not be permitted to file a counterclaim in the same suit for damages to the freight in transit, since, to permit a deduction from freight charges on such account would be to open the door to fraudulent rebates under the guise of freight loss claims. (United States District Court, Southern District of Iowa, Illinois Central Railroad Company vs. W. L. Hoopes & Sons, 233 Federal Reporter, 135.)

EMPLOYER'S LIABILITY FOR PHYSICIAN'S NEGLIGENCE.—An employer who, under agreement with his employees, makes deductions from their wages to defray the cost of employing a physician to attend them and their families in case of accident or illness, incurs no liability on account of negligence or unskillfulness of that physician, if the employer derives no profit from the arrangement and has used a reasonable degree of care to retain a suitable physician. (Mississippi Supreme Court, Eastman, Gardiner & Co. vs. Permenter, 72 Southern Reporter, 234.)

INJURY TO WORKMAN OUTSIDE SCOPE OF EMPLOYMENT.—If an employee, without authority from his employer, voluntarily steps beyond the scope of his employment to assist another employee and is injured while doing so, he cannot recover damages against his employer. (Alabama Supreme Court, Republic Iron & Steel Company vs. Howard, 72 Southern Reporter, 263.)

LIABILITY OF INITIAL CARRIERS.—A bill of lading covering a through shipment of freight from a point in the United States to a destination in a foreign country, to be carried over connecting lines, may validly limit the liability of each carrier to losses occurring on its lines; the clause of the Carmack amendment to the Interstate Commerce Act, declaring an initial carrier of a through shipment to be liable for losses occurring anywhere en route, being limited to shipments between interstate points. (South Carolina Supreme Court, Aldrich vs. Atlantic Coast Line Railroad Company, 89 Southeastern Reporter, 315.)

OBLIGATIONS OF CO-PARTNERS.—A partner is not liable to his associates for a loss resulting from an innocent mistake made in transacting firm business. So far as losses result from mere errors of judgment not amounting to bad faith, fraud or reckless disregard of his obligations, they must be borne by the firm. Nor does a partner impliedly make any representation as to his capacity to transact the partnership's affairs. (Massachusetts Supreme Judicial Court, Hurter vs. Larrabee, 112 Northeastern Reporter, 613.)

COMPUTING SALESMAN'S COMMISSION.—Since well-established trade customs are presumed to enter into contracts which do not contain express provisions to the contrary, in computing a salesman's commission on a basis of "net sales," the employer is entitled to deduct commissions paid jobbers, who guaranteed the accounts of retail dealers to whom the salesman made sales, and also entitled to deduct on account of "free goods" given as premiums and freight prepaid on shipments; those deductions being authorized by trade custom. (South Carolina Supreme Court, Friedheim vs. Walter H. Hildic Company, 89 Southeastern Reporter, 358.)

SHIPPER'S RIGHT TO RECLAIM GOODS NOT PAID FOR.—When it is agreed under a contract for sale of goods that title is not to pass until the buyer pays the price, payment being understood as to become due when loading is completed, and the purchaser fails to pay then, the seller is entitled to reclaim possession, and the railroad company's refusal to surrender possession renders it liable to the shipper for the value of the goods, although they were loaded on a car furnished by the contract purchaser. Nor is the railroad company entitled to require the shipper to give a bond to indemnify the company against liability to the buyer, as a condition to surrender of the goods, when the shipper is plainly entitled to possession. Refusal to deliver except upon such condition is the same in legal effect as an unqualified refusal to deliver. (Niagara County, N. Y., Court, Wilson vs. International Railway Company, 160 New York Supplement, 367.)

EFFECT OF CHECK OR DRAFT AS PAYMENT OF ACCOUNT.—In a suit against a buyer of a pump to make good a bank draft given in payment but not paid because of failure of the bank, it is held that a note, check or draft does not absolutely discharge the debt for which it is given, unless there is something to show that the creditor has accepted it on that condition. Ordinarily, acceptance of such paper is presumed to be only a conditional discharge of the debt, the condition being payment of the note, check or draft. (Colorado Supreme Court, Globe Express Company vs. Taylor, 158 Pacific Reporter, 717.)

CONDITION OF STEEL CASTINGS SOLD.—Under an agreement to sell castings of ductile steel metal, having a tensile strength of from 55,000 to 65,000 lb. to the square inch, and conforming to certain specifications, the seller, not knowing that the castings were intended to be used in making ammunition hoists for the Government, was not bound to furnish castings which would pass inspection under the buyer's contract with the Government. (New York Supreme Court, Appellate Division, Atlanta Machine Works vs. Felthousen, 160 New York Supplement, 29.)

RIGHTS OF NON-RESIDENT CORPORATIONS.—It was no defense to an action brought by a non-resident corporation to recover the price of a water wheel that the company had not complied with the laws of the State governing non-resident corporations engaged in doing business in the State, if the transaction was one in interstate commerce; such laws being restricted in their operations to purely intrastate dealings. (Alabama Supreme Court, Hurst vs. Fitz Water Wheel Company, 72 Southern Reporter, 314.)

VALIDITY OF CONVEYANCE AS AGAINST GRANTOR'S CREDITORS.—A brass works company bought real estate from a married woman to whom her husband had conveyed it. Held, that the company is entitled to hold the property as against the husband's creditors, although he may have intended to defraud them, if there was a substantial, although inadequate, consideration for the transfer to the wife, and if neither the wife nor the company participated in the fraudulent intent of the husband to hinder, delay or defraud his creditors. (Alabama Supreme Court, London vs. G. L. Anderson Brass Works, 72 Southern Reporter, 359.)

LIABILITY FOR CRANE ACCIDENT.—A steel and iron company may be held liable for fatal injury to the operator of a crane used in handling iron ore, due to collapse of bents of a trestle on which the crane was being operated, on it being found that the company was negligent in failing to have the bents properly braced, considering the weight of the crane. (Alabama Supreme Court, Sloss-Sheffield Steel & Iron Company vs. Scivally, 72 Southern Reporter, 349.)

Machinery Markets and News of the Works

NORMAL HEALTHY DEMAND

Scattered Orders Equalize Facilities

High Cost of Materials a Vexatious Question with Manufacturers—Economical Production Engaging More Attention

The demand for metal-working machinery is steady and widely diffused, and practically on a normal basis, in that there is no call for tools in lots of abnormal size. Machines are wanted principally to round out manufacturing facilities, and thus maintain maximum production. Deliveries are not much changed. Another indication of the approach of normal times is that manufacturers are giving more attention to improved shop methods involving costs.

Machine-tool builders, like other consumers of metal, find the high cost of materials, coupled with delayed deliveries, a vexatious question, especially those who have not sufficiently advanced prices to meet the situation.

Cleveland reports a good scattered demand for lathes, shipments of which are now considerably easier. In Milwaukee, the tool builders are less crowded than they have been heretofore, but new plants in that territory are taking a goodly amount of equipment.

Detroit factories are running full, likewise those at Niles, and extensions are going on steadily. Automobile makers are the most active purchasers in Cincinnati, where attention is drawn to the high cost of materials.

Shipbuilding continues very active in the Pacific Northwest, although other industries are no less busy. The car situation in Oregon has become exceedingly grave, as it promises to become in other sections of the country. Detroit manufacturers have held a meeting in conjunction with railroad heads, with a view of conserving the supply of freight cars.

Shell orders continue to be placed in Canada, where the officials are worried over the short supply of forgings suitable for large shells. Only four companies in Canada are engaged in making forgings for large shells.

New York

NEW YORK, Aug. 30, 1916.

The machine-tool business is strong and without the slightest trace of any weakness; but it is limited, especially with standard makes, by the ability to get equipment. Shops are now generally in the market for such tools as are needed to keep all departments up to the proper operating standard. This is the reason for the continued call for small lots and single tools which makes up the greater part of the trade to-day. Deliveries have shown no improvement worth mentioning; with some it is a bit better, with others not so good. Orders for radial drilling machines, for instance, are now being booked for delivery into next March.

Many machine shops that took on munition work for which their equipment was not originally installed and have not found it particularly remunerative, have recently taken advantage of renewed demand in their special lines to close out war business.

In spite of the good times manufacturers are enjoying, they are showing an increased interest in shop costs. Makers of time-keeping devices report a vastly improved demand for their equipment within the past year.

Recent buyers in this market include the McNab & Harlan Mfg. Company, Benjamin Eastman and the Watson-Stillman Company.

The Evans Addressing Machine Company, Inc., 257 Washington Street, Buffalo, N. Y., has increased its capital stock from $20,000 to $50,000 to provide for a contemplated extension of its business. Chauncey J. Hamlin is president and Guy J. Evans, secretary and treasurer.

The National Bridge Works, Review Avenue, Long Island City, N. Y., recently increased its capital stock from $225,000 to $300,000 in order to provide funds for increasing the efficiency of its plant. Practically all the necessary equipment for this improvement has been provided. T. J. Foster is president.

The Clyde Motor Truck Company has purchased five acres at Farmingdale, Long Island, having 15,000 ft. frontage on the Long Island Railroad, with option on an adjoining 40 acres, and will construct a one-story factory of saw-tooth type, having about 12,000 sq. ft. of floor space for the manufacture of motor trucks. It is incorporated for $750,000. Mahlon C. Swartz is president; W. J. Melhiush, Jr., recently with the White Motor Company, is vice-president and general manager; P. R. MacLean, formerly American representative of Frazer & Best, Ltd., foreign motor vehicle exporters, is secretary and export manager; E. E. Vreeland, president of E. E. Vreeland, Inc.(advertising), is treasurer. P. J. Holdworth, formerly of the Chalmers Motor Car Company, is efficiency engineer and W. J. Kenlon, formerly with the Christie Front Drive Motor Company, is factory representative.

The Pyrene Mfg. Company, 52 Vanderbilt Avenue, New York, manufacturer of fire extinguishers, has recently increased its manufacture to include a complete line of fire-fighting appliances, excepting only large vehicles and sprinkler systems.

The Hood Furnace & Supply Company, Corning, N. Y., is making additions and improvements to its manufacturing plant on East Third Street.

The Bayer Brothers Company, Rensselaer, N. Y., Dr. Emanuel Von Salis, manager, is taking bids for a factory building 76 x 164 ft., two stories, to be erected on Riverside Avenue, at an estimated cost of $35,000.

The Up-to-Date Advertising Company, Canisteo, N. Y., H. W. Kellogg, president, is building an addition to its plant for the manufacture of signs.

The Carthage Sulphite Pulp & Paper Company, Carthage, N. Y., J. A. Outerson, manager, is building a machine shop addition, 60 x 60 ft., at its plant.

The Empire Mfg. Company, Franklinville, N. Y., George G. Ferris, president, is building a two-story addition, 37 x 155 ft., to its manufacturing plant.

The Hahn Paper Company, Watertown, N. Y., J. W. Hahn president, has let contract for the erection of a machine shop, 90 x 90 ft., and a storehouse, 15 x 90 ft., one story, to be erected on Sewells Island at a cost of $15,000.

The Driver-Harris Wire Company, Harrison, N. J., has completed plans for an addition to its plant to cost approximately $10,000.

Miller & Canary, 42 Paine Street, Troy, N. Y., are taking bids for a two-story addition to their factory.

The North Buffalo Hardware Foundry Company, Buffalo, has taken out a building permit for an extension, 60 x 90 ft., to its foundry at Hertel Avenue and the Erie Railroad.

The C. Kurtzman Company, Buffalo, manufacturer of pianos, is building a brick addition to its factory at Seventh and Hudson streets.

The Schoellkopf Aniline & Chemical Works, Buffalo, has filed plans for a two and three-story, steel and brick addition to its dye works at Abbott Road and the Buffalo Creek Terminal Railroad, to cost $140,000, and a five-story reinforced concrete and brick warehouse to cost $202,700.

The Rome Mfg. Company, Rome, N. Y., has let contracts for the erection of an annealing building, 40 x 129 ft., one story, and a box factory, 40 x 156 ft., one story, at its plant on Railroad Street, to cost $30,000. E. L. Spriggs is superintendent.

The Lockport Glass Company, Lockport, N. Y., M. Woodard, manager, has let the general contract for the erection of a factory building, 60 x 400 ft., one and two stories, on Michigan Street, to cost $50,000.

Will & Baumer, Syracuse, N. Y., Anthony Will, president, are taking bids on revised plans for three-story factory building, 70 x 178 ft., to be added to their plant at Greenport at an estimated cost with equipment of about $300,000.

The Transmission Ball Bearing Company, W. J. Murray, president, Toronto, Ont., is having plans prepared for a branch plant building which it contemplates erecting at Buffalo.

The Excelsior Steel Ball Company, Buffalo, E. A. Jones, manager, has let contract for the erection of a forging shop, 50 x 115 ft., one story, at its plant on Military Road and the New York Central Railroad, North Buffalo.

The American Brake Shoe & Foundry Company, Erie, Pa., has let contract to the Austin Company, 14,230 Euclid Avenue, Cleveland, Ohio, for the erection of a foundry building, 75 x 800 ft., one story, at Twelfth and Payne streets.

Philadelphia

PHILADELPHIA, PA., Aug. 28, 1916.

The Pennsylvania Gauge & Tool Company, Bellevue Court Building, Philadelphia, recently incorporated, has been absorbed by the Luster-Jordan Company, Franklin Avenue and Washington Street, Norristown, Pa., of which C. H. Stoer of Sherritt & Stoer, Finance Building, Philadelphia, is treasurer.

The John E. Sjostrom Company, 1719 North Tenth Street, Philadelphia, manufacturer of bank and office furniture, lost its plant by fire recently with an estimated damage of $150,000, including stock worth about $80,000 and machinery worth about $20,000.

The Pennsylvania Railroad Company has awarded contract to the Roydhouse-Arey Company, Philadelphia, for the erection of a one-story brick and reinforced concrete power house, to be erected at its Reed Street freight yard at an estimated cost of $22,000. It will be 30 x 86 ft.

Bradlee & Co., Inc., of Philadelphia, has been organized with a capital stock of $50,000 by Arthur H. Gerhardt, 5625 Overbrook Avenue; Trenchard E. Newbold, 405 South Twenty-second Street, and Albert P. Gerhardt, 2307 North Fifty-eighth Street, to manufacture chains and accessories.

The Allen Chemical Company, Allentown, Pa., has been incorporated with a capital stock of $50,000 by Irwin Huebner, treasurer, and others, to manufacture chemicals.

The Home Service Garage, Philadelphia, has been incorporated with a capital stock of $10,000 by Joseph Henry, Jr., treasurer, 5232 North Broad Street, to operate a garage and repair shop.

The General Engineering Works, Inc., Philadelphia, has been incorporated with a capital stock of $100,000 by A. M. VanFosson, Norristown; M. T. Gemmell, 6048 Carpenter Street, and James Gemmell, Jr., 6048 Carpenter Street, Philadelphia, to manufacture boilers, engines, machinery and accessories.

The Steckel Rupp Company, Allentown, Pa., has been incorporated with a capital stock of $10,000 by V. H. Steckel, 12 North Seventh Street, Allentown; Charles H. Rupp, K. S. Steckel, Horace Wickersham and H. A. Schantz, all of Allentown, to manufacture motor-vehicle accessories.

The Mount Union & Huntingdon City Garage Company, Mount Union, Pa., has been incorporated with a capital stock of $50,000 by Ralph B. Cassady, Mount Union, Pa.; Harry W. Wagner and A. R. Petterson, Huntingdon, Pa., to operate a garage and repair shop.

The V. V. Fittings Company, Philadelphia, has been incorporated with a capital stock of $150,000 by John F. Burns, 1511 Allegheny Avenue; William T. Pringle, Wyncote, Pa.; William Gloeckner, Trenton, N. J., and Arthur E. Pringle, 545 Brinton Street, Philadelphia, to manufacture electrical and mechanical supplies.

The Doyle-DaCosta Mfg. Company, Easton, Pa., has been organized with a capital stock of $50,000 to manufacture insulated wire and electrical appliances. A building has been secured and about 60 men will be employed when operations begin. William A. Doyle and Robert C. DaCosta are the incorporators.

The National Alloy Company, Philadelphia, Pa., recently purchased from the Pennsylvania Railroad Company the property at the corner of Twenty-fifth and Dickinson streets. No changes are contemplated at present, but the company expects to take on some additional lines shortly.

Plans are in progress for a one-story shop building, 80 x 100 ft., for the Autocar Company, Ardmore, Pa.

The Tinius Olsen Testing Machine Company, 500 North Twelfth Street, Philadelphia, will soon begin the erection of a four-story addition, 50 x 60 ft., to be used for pattern storage. A large factory extension will be made in the spring.

New England

BOSTON, MASS., Aug. 28, 1916.

The Colt Patent Fire Arms Mfg. Company, Hartford, Conn., is to build a new armory, 60 x 500 ft., four stories. The company now has contracts with nine foreign governments and expects to secure a large contract under the appropriations of the new army bill now before Congress. It now employs 2500 men and expects to expand to 3000. A contract for a new office building, 48 x 50 ft., has also been awarded.

It is currently reported that the Howe Scale Company, the largest industry in Rutland, Vt., is about to be acquired by new owners. This is part of a plan to merge the scale factories throughout the country. John A. Mead, who represents the controlling interest in the business, while not denying the transfer, states the business will remain in Rutland and that he will continue as its head. Extensive additions are in progress and it is expected the force of workmen will be considerably enlarged.

The Southington Hardware Company, Southington, Conn., has awarded a contract for the erection of two additions, 50 x 72 ft., one story, and 40 x 144 ft., two stories.

The Brass City Machinery & Tool Works Company, Waterbury, Conn., has been incorporated with a capital stock of $5,000 by George Fritz, Albert H. Mitchell, Emma S. Mitchell and Charles O. Nelson.

The B. & K. Company, formerly the Barnes & Kobert Company, Milldale, Conn., began work in its new factory on Ellis Street, New Britain, Conn., Aug. 28. The directors are contemplating the erection of a forge and galvanizing shop, 60 x 180 ft.

The Hinckley Mfg. Company, Turners Falls, Mass., cutlery specialties, has been incorporated with capital stock of $50,000 by Benjamin B. Hinckley, president; Walter H. Ray, treasurer, and F. W. Hance.

The Wire Novelty Company, Second Avenue, West Haven, Conn., has awarded a contract for an addition.

The Automatic Wood Heel Machinery Company, Lynn, Mass., has been incorporated with a capital stock of $25,000 by Joseph G. Redshaw, George O. Perkins, John G. Pool and Frank E. Longby.

Work has been started on an addition, 30 x 130 ft., one story, to the plant of the American Brass Company, Liberty Street, Ansonia, Conn.

The Motor Industry Appliance Company, Springfield, Mass., has been incorporated with a capital stock of $50,000 by Frank W. Arthur, Anton C. Schmelzer, Benjamin F. Arthur and Ralph S. Miles.

The Billings & Spencer Company, Hartford, Conn., has awarded a contract for the erection of an addition to its forge shop, 87 x 290 ft., one story, and an addition to its machine shop, 70 x 120 ft., two stories. A portion of the forge shop addition will be used to increase the heat treating facilities. The company has occupied its new plant less than a year, but its greatly increased business makes it necessary to enlarge the forge shop nearly 50 per cent and its other departments to correspond.

The Naillick Motor Signal Company, Boston, Mass., has been incorporated with a capital stock of $500,000. The directors are Laurence J. Killian, 38 Clive Street, president and treasurer; William W. Killian and O. E. Perrigo.

The New England Bolt Company, Everett, Mass., has been incorporated with a capital stock of $20,000. The directors are William E. Clark, president; Kenneth T. Burr, Dorchester, treasurer, and E. W. Blodgett.

The casting shop of the Bristol Brass Company, Bristol, Conn., has been completed by the Austin Company and the same contractors are now beginning the erection of a foundry, 62 x 250 ft.

The Bullard Machine Tool Company, Bridgeport, Conn., has begun the erection of another unit, 44 x 112 ft., five stories, of its new plant. The old buildings are being replaced as fast as possible by new structures.

The Rumford Electric Alloys Company, Portland, Me., has been incorporated with a capital stock of $200,000. The officers are Charles M. Drummond, president; Wadleigh B. Drummond, treasurer; Joshua H. Drummond, clerk.

The American Brass Company, Waterbury, Conn., has awarded a contract for two additions on Washington Ave

nue—a rolling mill, 80 x 240 ft., one story, and a furnace room, 60 x 160 ft.

The Universal Winding Company, Elmwood Avenue, Providence, R. I., is having plans drawn for a foundry building.

The Bosch Magneto Company, Springfield, Mass., has awarded a contract for a boiler house, 45 x 60 ft.

The Hemphill Mfg. Company, Central Falls, R. I., has awarded a contract for an addition.

The Taunton Rivet Works, Taunton, Mass., is to build an addition.

The American Voting Machine Company, Waltham, Mass., is to build an addition, 40 x 140 and 20 x 40 ft., one story, to its plant on South Street.

Murray & Sorenson, 352 Pearl Street, New York City, are having plans drawn for a factory at Roxbury, Conn., to replace one recently destroyed by fire.

Baltimore

BALTIMORE, MD., Aug. 28, 1916.

The Poole Engineering and Machine Company, Woodberry, Md., is understood to be planning the construction of a 20 x 60 ft. addition to its machine shop.

Extensive improvements have been started at the plant of the Pusey & Jones Company, Wilmington, Del.

Contract for an addition which will cost in the neighborhood of $25,000 has been awarded by the Baltimore Tube Company, Ostend and Wicomico streets, Baltimore.

The Coastwise Shipbuilding & Lighterage Company, 401 Keyser Building, Baltimore, has made application to use the property at the foot of Andre Street as a woodworking factory and to install 270 hp. in motors.

Heard & Cardwell, Danville, Va., are seeking prices on cold storage equipment and boilers.

The Titmus Optical & Instrument Company, Petersburg, Va., has been incorporated with $25,000 capital. J. A. Rucker is president.

Plans to greatly increase its output are being made by the Norfolk Mattress Company, Granby and Twenty-third streets, Norfolk, Va.

Extensive improvements, including a boiler house, engine room, etc., are planned by the Consumers' Ice & Coal Company, Front Street and Edgmont Avenue, Chester, Pa. The ice output will be greatly increased.

Chicago

CHICAGO, ILL., Aug. 28, 1916.

The machinery business in August has been marked by a decided revival, sales having increased to the regular domestic trade as well as in connection with new ammunition contracts. The demand for lathes, however, is still checked and the larger business has been felt more particularly by builders of milling machines, boring mills and grinders. Automobile manufacturers have recently been large purchasers. A few uncompleted railroad purchases still remain in the market but no new requirements have appeared.

The Kling Brothers Engineering Works, Chicago, builder of boiler shop and steel fabricating tools, has placed a contract for a new foundry.

The Pyle National Electric Headlight Company, 900 South Michigan Avenue, Chicago, will erect a plant to cost $250,000. It will include a machine shop, 132 x 280 ft., a pattern shop, foundry, 80 x 236 ft., forge shop, 48 x 94 ft., and power house.

The Variety Mfg. Company, 2942 Carroll Avenue, Chicago, is about to erect a three-story factory to cost $40,000. It is a fabricator of light steel work for buildings.

The former Whitcomb Agricultural Implement factory at Rochelle, Ill., has been acquired by the Thomas Dugan Mfg. Company, Wichita, Kan., which will operate it for the manufacture of harvesting machinery. The Dugan Company expects to have its machinery installed and the plant in operation by Sept. 1.

The American Mfg. Company, Waterloo, Iowa, C. D. Pedersen, president, has been incorporated with a capital of $100,000 and is having plans prepared for a three-story manufacturing plant.

The Hart-Parr Company, Charles City, Iowa, is preparing to build an addition to its steel foundry to cost $100,000.

The Johnson Hay Stacker Company, Norfolk, Neb., has purchased additional property on which a machine shop, 75 x 150 ft., will be added to meet the need of increased factory capacity.

The American Dump Car Company, 1004 Pioneer Building, St. Paul, Minn., manufacturer of dump cars, frogs, switches and contractors' equipment, has under consideration the erection of a new plant in that city.

The Pilot Motor Car Company, Richmond, Ind., announces that within the next few months its plant will be enlarged to permit an increase of 50 per cent. George E. Seidel is president.

Detroit

DETROIT, MICH., Aug. 28, 1916.

Local factories are full of orders and their products are commanding high prices. The temporary summer lull has been passed satisfactorily. Those concerns which slow down annually for inventory, repairs, vacations, etc., are getting under headway, with every indication of plenty of business. Officials of Detroit's manufacturing institutions held a meeting with railroad men from all parts of the United States last week to discuss plans for the conservation of freight cars to prevent a possible shortage. The raising of the present high demurrage rates and the shortening of the free time limit for unloading were suggested by the latter as a remedy for the threatened interference with business.

The Consolidated Car Company, manufacturer of the Abbott-Detroit car, is to move to Cleveland in January. The company has purchased six acres of land in East Cleveland in the vicinity of the Chandler, Jordan and General Electric plants. At a recent meeting the stockholders of the company increased the capital stock from $500,000 to $1,250,000. The name of the company has also been changed from the Consolidated Car Company to the Abbott Corporation.

Practically all of the manufacturing concerns in Niles, Mich., report great trade activity and are increasing their facilities. The National Standard Company, manufacturer of reinforcing fabric for automobile tires, automobile jacks, copper lighting cables, etc., has completed a big factory addition this year. The Acme Belting Company is also making rapid progress, having installed additional room which doubles its capacity.

The Schwarz Foundry Company, Detroit, has been incorporated, with a capitalization of $75,000, by Frank L., Frank L., Jr., and Elmer H. Schwarz.

The Star Auto Company, Holland, Mich., has been incorporated with a capitalization of $25,000.

The Chicago Stove & Range Company, now located at Fulton, Ill., has made a proposition to the Chamber of Commerce of Benton Harbor, Mich., to locate its plant in that city. The rail and water shipping facilities and the close proximity of the city to the great Chicago market are considered strong industrial inducements.

The Standard Malleable Iron Company, Muskegon Heights, Mich., has increased its capital from $100,000 to $250,000.

The Michigan Metal Supply Company, Detroit, has been incorporated with a capital stock of $5,000. The stockholders are David C. Creider, John E. Pankhurst and Ignace Capizzi.

The Chopa Piston Ring Company, Detroit, has incorporated with a capitalization of $10,000. The stockholders are John A. Chopieska, Anna R. White and George W. Angell.

The Graham-Bell Company, a corporation organized under the laws of South Dakota, and incorporated with a capital stock of $250,000, has leased the factory building at Lake Odessa, Mich., formerly occupied by the Brown-Hawkins Lumber Company, and will shortly commence putting in machinery to make valves of all descriptions.

Permits have been issued for three new automobile factory buildings for Dodge Brothers, Detroit, to cost $343,000.

The Bryant Paper Company, Kalamazoo, Mich., is contemplating the construction of an immense pulp mill in Canada involving the investment of approximately $1,500,000. The company has the distinction of being the largest bookpaper maker in the world. It operates ten machines at this time and has prepared plans and specifications looking to the addition of two more machines, each 154 in. in width.

The Campbell Mfg. & Foundry Company, H. D. Campbell, president, has been organized to build a foundry at Muskegon, Mich. A site has been acquired and a building, 110 x 180 ft., will be erected. The company has a capitalization of $100,000.

The Michigan Bolt & Nut Works, Detroit, has started the construction of an additional two-story building, 80 x 120 ft., of steel and concrete, to be used for its stock, packing and shipping departments. This will release present quarters for additional manufacturing use and will add 25 per cent of floor space. The new building will be erected adjoining the present plant on river-front property acquired in 1905. In 1907 it fixed its capital stock of $300,000, where it now remains. Its activities include the manufacture of carriage and machine bolts, lag screws, hot-pressed nuts, forged turn-

bucking, drop forgings and special forgings. Its facilities for cold heading small-sized bolts have been increased recently. L. C. Barbour is president, F. S. Bigler is vice-president, treasurer and general manager, and R. H. Hill is secretary.

Milwaukee

MILWAUKEE, WIS., Aug. 28, 1916.

Numerous extensive plant additions and new construction in this district are noted by companies directly identified with the metal-working industry, which require large equipments of light and heavy machine tools and a varied lot of machinery. Machine-tool builders report their capacities well taken up with orders, but they are not so crowded as six months ago. In some instances bookings assure full operations for six to ten months ahead. Working forces are rapidly assuming normal proportions, the effect of the machinists' strike for an 8-hr. day having been minimized. The strike is generally regarded as being already a failure, although strike leaders are vigorous in denying the well-founded reports that the men are thoroughly disappointed and getting back to work with the least possible delay. Activity in all lines of industry is evident.

The Briggs & Stratton Company, 258-264 Milwaukee Street, Milwaukee, manufacturer of automobile and gas engine ignition specialties, switches, etc., announces that it will erect a five-story and basement factory, 60 x 220 ft., of reinforced concrete and steel, on Hopkins Road, near Center Street, at a cost of approximately $100,000. Herman J. Esser, architect, Camp Building, has completed plans and will close bids Sept. 1. The company will build its own power house and is in the market for boilers, engines, generators, etc., in addition to some machine tool and general shop equipment. Two electric freight elevators are specified. Stephen F. Briggs is general manager.

The Southern Wisconsin Electric Company, Lake Geneva, Wis., will issue $128,000 of bonds for improving and extending its plant.

The Munkwitz Realty Company, 431 Milwaukee Street, Milwaukee, has engaged Kirchhoff & Rose, architects, Majestic Building, to prepare plans for a garage and repair shop, 60 x 120 ft., three stories and basement, to be erected on Broadway.

Watertown, Wis., is asking bids until Sept. 18 for furnishing a combination hose and chemical motor car equipped with a 300-gal. pumping engine. Frank S. Weber is city clerk.

The International Dye Company, Milwaukee, has been incorporated with a capital stock of $30,000 to manufacture chemicals, dyestuffs, etc. The incorporators are William F., Rudolph A. and August Oesterreich.

The Ritter Automobile Company, Madison, Wis., will build a two-story addition to its garage and machine shop, making the enlarged structure 66 x 256 ft. Work will begin Sept. 1.

The Christensen Engineering Company, 847 Thirtieth Street, Milwaukee, manufacturer of engines, machinery and compressed air and pneumatic equipment, will increase its capital stock from $300,000 to $1,000,000. The new issue will be devoted to caring for the increasing business and no important extensions are planned at this time. Nels A. Christensen is president and general manager.

The Stewart-Warner Speedometer Company, 1828 Diversey Boulevard, Chicago, has awarded contracts for the extensive additions to the foundry of the Warner works, Beloit, Wis., to Jens Jensen, 1634 Mozart Street, Chicago. Specifications call for an iron foundry, 122 x 530 ft., a core building, 70 x 80 ft., and a brass foundry and storage building. The buildings will be of steel and brick, one story, with saw-tooth roofs. The Beloit works will be devoted to finishing raw materials for assembling and final operations at the Chicago works, which recently have been enlarged.

Fred Maettig, architect, 2906 North Avenue, Milwaukee, has been engaged to prepare plans and supervise the construction of a factory and power plant, the owner and location being withheld for the present. The building will be 40 x 76 ft., with an engine and boiler house, and will require power equipment, generators, belting, shafting, an ice machine and elevated tracks with carriers and hoisting device.

The Eau Claire Mfg. Company, Eau Claire, Wis., has purchased the entire business and works of the Bloomer Machine Works, Bloomer, Wis., manufacturer of gasoline engines and machinery. The machinery and equipment will be moved to Eau Claire at once and the real estate and buildings will be disposed of. The Bloomer Company was founded in 1896 by Charles Keller, who became manager of the Eau Claire Mfg. Company five years ago and now resumes control of his designs.

The Simms Foundry Company is the new style of the Racine Foundry Company, Racine, Wis., manufacturer of gray iron castings, and wood and metal patterns.

Bernard Larson, Rhinelander, Wis., has purchased the entire equipment of the machine shop of A. C. Velton and is installing it in his factory and shop. Mr. Larson will continue to make a feature of manufacturing shafting of his own design and now is equipped to do custom machine work.

Contracts have been let for the addition to the plant of the Milwaukee Stamping Company, Sixty-fourth and Pullen avenues, West Allis, Milwaukee, 72 x 122 ft., and to cost $17,000. Work is well under way.

The Superior Box Company, Harper Avenue and the Northern Pacific Railroad, Superior, Wis., has broken ground for a new bolt sawmill, 50 x 140 ft., to cost $15,000. A new boiler house, 48 x 48 ft., is being completed, and three new boilers and a 350-hp. steam unit are being installed. The old engine will be used to operate the new bolt mill.

The Kissel Motor Car Company, Hartford, Wis., is adding two more buildings to its plant. When these are finished more than 60,000 sq. ft. of floor space will have been completed during 1916. Further expansion plans are under way.

The R. L. Kenyon Company, Waukesha, Wis., manufacturer of camp furniture, etc., advises that it has not abandoned its plan for establishing a department for the manufacture of fiber-reed furniture, as previously stated. It is now filling an order for 85,000 cots for the United States Government and not 30,000.

Cleveland

CLEVELAND, OHIO, Aug. 28, 1916.

A good scattered demand exists for small lots of machinery, particularly for lathes. Shipments of standard lathes to dealers are now coming in quite satisfactorily, so that dealers are able to make fairly good deliveries. The miscellaneous demand for small lots of turret lathes is quite active. A Cleveland manufacturer reports the volume of business is fully equal to production so that no further gain is being made on deliveries. A local maker during the week took an order for 29 turret lathes for shipment to Russia, and an inquiry is pending for 50 turret lathes for use in making fuses. A good demand is noted for pneumatic tools for domestic use and for export. Considerable foreign business in this line is coming from Russia. The demand for cranes for shop purposes is holding up well. Among the orders just placed is one from the Firestone Tire & Rubber Company, Akron, Ohio, for a number of cranes.

The Acme Metal Stamping Company, Cleveland, recently incorporated, with a capital stock of $10,000, has established a temporary plant in the Perkins Power Block, Frankfort Avenue, where it is making dies and tools preparatory to establishing a plant to manufacture switch boxes and other light sheet metal stampings. The company is looking for a permanent site. It has all the press equipment needed for the present, but is in the market for a small surface grinder. The officers are R. A. Neff, president; F. A. Neff, vice-president; J. C. Bayliss, secretary and treasurer.

The C. M. Yoder Company, Cleveland, maker of sheet metal working machinery and cold rolled steel, will enlarge its plant at Walworth Avenue and West Fifty-fifth Street by the erection of a one-story addition, 108 x 156 ft., more than tripling its present capacity. It will require some additional machinery equipment, including lathes, drill presses, shapers and grinders.

The Ben-Hur Motor Company, Cleveland, has purchased a 10-acre site at Willoughby, Ohio, where it will erect a new automobile plant. It is stated the company plans to spend about $300,000 in the erection of a plant and that a contract for the first of three units has been placed. This building will be 150 x 400 ft., of steel and concrete.

The Dann Products Company, Cleveland, has acquired a site on East 152d Street on which it will erect a plant for the manufacture of automobile spring lubricating devices. Victor Sincere and others are interested.

M. S. Gartland, Marion, Ind., and J. J. Carroll, Cleveland, have signed a contract with the Federated Commercial Club, Sandusky, Ohio, to establish a foundry in that city. The plant, the erection of which will be started shortly, will be located on West Monroe Street, and will include a main foundry building, 84 x 300 ft., a finishing building, 100 x 100 ft., storage building and office.

The Woods Engineering Company, Alliance, Ohio, will double the capacity of its plant by the erection of a brick addition, 40 x 45 ft.

The Collier Motor Truck Company, Painsville, Ohio, recently organized, will establish a plant to manufacture light motor trucks in the building formerly occupied by the Vulcan

Company. M. E. Crow is president. W. A. Collier and John Crain are also identified with the company.

The Westgard Tire & Rubber Company, Warren, Ohio, incorporated with a capital stock of $1,500,000, will build a plant for the manufacture of rubber tires. Plans have been completed and the erection of the plant will be started shortly.

The Carroll Foundry & Machine Company, Bucyrus, Ohio, will erect a new machine shop considerably larger than the old building, recently destroyed by fire, and in addition will build an erecting shop and blacksmith shop. Machinery and crane equipment will be required.

The Kelley Vault Mfg. Company, Bucyrus, Ohio, will enlarge its plant by the erection of a two-story brick and steel addition, 50 x 150 ft. It manufactures burial vaults, boilers, tanks, etc., and is reported to have been given a contract for building boilers and tanks for the Ohio Locomotive Crane Company.

The Power Mfg. Company has placed a contract for the erection of a plant in Marion, Ohio, to cost $70,000. It will be erected by the Bellefontaine Bridge & Iron Company.

The recently organized Napoleon Crown Fender Company, Napoleon, Ohio, will manufacture fenders and other stamped metal parts for automobiles, and has established a plant in a leased building along the Wabash track. The officers are Cyril Donnelly, president; L. W. Schultz, vice-president; Gerald Donnelly, secretary and treasurer, and W. A. Bockalman, general manager.

R. F. Marsh and Frank Lause, Delphos, Ohio, and John Grubb and R. W. Berry, Lima, Ohio, have acquired the interest of Joseph L. Fortener in the Delphos foundry and have organized a new company under the name of the Delphos Foundry Company. It is stated that the plant will be enlarged. The new officers are R. F. Marsh, president; R. W. Berry, vice-president; John Grubb, secretary and manager, and Frank Lause, treasurer.

The Wolverine Auto Company has established a plant at 2929 Dorr Street, Toledo, Ohio, for the manufacture of automobiles.

The Bock Bearing Company, Toledo, Ohio, has under construction a four-story addition, 60 x 270 ft., of steel and concrete construction. This will more than double the present capacity.

The National Forge & Tool Company, Erie, Pa., will move its Erie works to Irvine, Pa., where it has another plant in operation. The Irvine plant will be enlarged to accommodate the work now done in Erie.

Cincinnati

CINCINNATI, OHIO, Aug. 28, 1916.

The railroad labor dispute has not yet cut down domestic inquiries for machine tools to any appreciable extent, but there has been a slowing down in the aggregate of domestic orders placed. Automobile manufacturers continue the best customers; the railroads are practically buying nothing in the machinery line. The high cost of material is a more vexing question than heretofore with a number of manufacturers. Several machine makers have not been successful in advancing selling prices to offset enhanced manufacturing costs; notably among these are makers of small electrical machines of all kinds. Tanks and low pressure boilers are also still somewhat behind the procession.

The two manufacturers of lift-trucks in this territory are overrun with orders, most of which are coming from established factories and not from new plants. The foundries are busier, due to the break in the hot weather.

The Cincinnati Ball Crank Company, Oakley-Cincinnati, intends to increase its capital stock at an early date and will add additional machinery. No building additions are planned for the immediate future.

The Ward Equipment Company, Cincinnati, has been incorporated with $10,000 capital stock by R. E. Ward and others, to deal in power machinery. Details as to the company's plans and location are now lacking.

The city of Middletown, Ohio, has authorized the expenditure of $14,500 for an extension to its waterworks plant. Additional pumping machinery will be required.

It is rumored that the United States Lathe & Machine Company, 2001 South Street, Cincinnati, contemplates adding equipment for increasing the output of its plant.

The Blackwood Steel Foundry Company, Springfield, Ohio, has commenced operating its large new plant, but will add more equipment later.

The addition to the plant of the Miller Improved Gas Engine Company, Springfield, Ohio, is now under cover. No extra equipment will be required.

Definite confirmation has not yet been secured as to the plans of the Columbus Forge & Iron Company, Columbus, Ohio, as to the size of its new plant, but it is known that plans are under way. The company recently secured an eight-acre site on Third Street.

The C. A. S. Products Company, Columbus, Ohio, recently received a large contract for automobile gears, and is gradually adding to its equipment.

The Industrial Bureau of the Chamber of Commerce, Columbus, Ohio, announces that the Peck Hardware Mfg. Company, Berlin, Wis., will remove its plant to Columbus in the near future. It manufactures mail boxes and other metal specialties.

The Shields Pattern Works Company, Columbus, Ohio, has removed its plant to more commodious quarters at 79 East Chestnut Street.

The Pilot Motor Car Company, Richmond, Ind., is having plans prepared for doubling the capacity of its plant.

The Central South

LOUISVILLE, KY., Aug. 28, 1916.

The demand for power and special machinery is unusually good. The cotton crop is now being ginned, which is responsible for a steady call for supplies from the ginners. Wood-working plants, including sawmills and furniture factories, are all busier than they have been for several years. Oil operations in eastern Kentucky are reaching a point where some substantial refining plants are being planned. Machinery companies look for one of the best fall seasons in a number of years, especially those making power plant equipment.

James M. Wilson, chief engineer of the Louisville Water Company, is completing specifications for an addition to the pumping station to be erected at a cost of $300,000. Bids will be taken some time in September.

A roundhouse will be equipped in Jeffersonville, Ind., by the Pittsburgh, Cincinnati, Chicago & St. Louis Railway with general offices at Pittsburgh.

The Southern Builders' Company, Owensboro, Ky., maker of structural steel, has leased the building of the Lee Machine Company and will install additional equipment.

R. Burleigh & Son, Dawsonsprings, Ky., are planning the purchase of a boiler and engine to develop about 35-hp. They are also adding machinery for turning handles.

The Hull Tank & Pump Company, Owensboro, Ky., has announced plans for purchasing machinery which will double the capacity of its plant. N. D. Hull is general manager.

The Sullivan Construction Company, Lexington, Ky., has the contract for the construction and equipment of a sewage disposal plant at a cost of $207,184 and is in the market for the machinery. Address George B. Carey, secretary and treasurer.

C. Mehigan, Clarksville, Tenn., is erecting a new building which will be equipped for sheet metal work.

Ben L. and Fred Dulaney, Bristol, Tenn., have acquired water power rights on the Holston River and are planning the establishment of a hydroelectric plant at a cost of $75,000.

The Union Stockyards & Packing Company, Chattanooga, Tenn., has been organized with $150,000 capital stock and will establish a meat packing plant. Refrigerating equipment will be one of the principal items. The C. L. Brooks Engineering Company, Moultrie, Ga., is in charge.

James C. Turpin, McMinnville, Tenn., has purchased the stone-cutting plant of J. T. Wilson & Co. and will install pneumatic cutting and polishing machinery.

The G. W. Simmons Company, 118 North Front Street, Memphis, Tenn., is in the market for a 25 to 30-kw. alternating-current generator, direct connected or belt connected to an engine.

The Anderson Tobacco Company, Gallatin, Tenn., is in the market for a 5-hp, three-phase, 220-volt motor, a nailing machine and a freight elevator. E. L. Anderson is secretary.

The John G. Duncan Company, 308 West Jackson Avenue, Knoxville, Tenn., is in the market for a 20-hp., 220-volt motor, an 18-hp. motor and a 15-hp. motor. It will also buy a 2-wheel emery stand and a 16 to 20-hp., second-hand, double-cylinder, double-drum hoisting-engine, with or without boilers.

The McClary-Jemison Machinery Company, Birmingham, Ala., contracting engineer, is in the market for three 150-kw., 550-volt, direct-current engine-type generators, complete with necessary switchboard. The company will also consider similar turbine-driven outfits. James R. Lowe is vice-president.

St. Louis

ST. LOUIS, MO., Aug. 28, 1916.

Machine-tool dealers report a good aggregate of business, but with no particular class of industries standing out more strongly than another in the demand. The easing up on deliveries enables new industries to make their purchases, which is of material benefit to the trade and also has led to an increase in investment in new operations. Second-hand equipment continues to be almost as desirable, as new tools and dealers' floors are well cleared.

The Federal Scale & Supply Company, St. Louis, Mo., has been incorporated with a capital stock of $12,000 by Anthony J. Laux, Gus C. Yoos and Charles H. Miller to manufacture scales and other mechanical appliances.

The Polar Wave Ice & Fuel Company, St. Louis, Mo., has purchased a site upon which it will erect and equip an ice-making branch, the machinery to cost about $15,000.

The Flatau Turbine Engine Company, St. Louis, Mo., has been incorporated with a capital stock of $100,000 by L. S. Flatau, T. G. Ratcliffe and E. D. Nims to manufacture steam turbine engines.

The LaBelle Funeral Car Company, St. Louis, Mo., has been incorporated with a capital stock of $35,000 by Barney L. Schwartz, William Gunther, Albert Blair and others to manufacture motor funeral cars.

The Vigar Motor Car Company, St. Louis, Mo., has been incorporated with a capital stock of $15,000 by George F. Vigar, Frank J. Riefling and others to equip a garage and machine shop.

The Warren Steel Castings Company, St. Louis, Mo., will build and equip additions to its plant. Electric equipment for operation will also be installed.

The planing mill of the Judson Roberts Lumber Company, Salem, Mo., has been destroyed by fire with a loss of about $25,000, largely on equipment, which will be replaced.

The Hathaway Motor Company, Kansas City, Mo., has been incorporated with a capital stock of $15,000 by C. N. and H. A. Hathaway and H. C. Page and will equip a repair and machine shop.

A roundhouse, turntable and repair shop will be equipped at Bird's Point, Mo., by the Iron Mountain Railroad, with the chief engineer at St. Louis headquarters in charge.

The National Mining Company, Joplin, Mo., has increased its capital stock from $32,000 to $64,000 to purchase additional equipment, including drilling machinery, etc.

The Valley Mfg. Company, Ironton, Mo., B. N. Brown, president and manager, is in the market for wood-working machinery.

The Wilson Stove Company will locate a plant at Metropolis, Ill., where the business men's organization gave $30,000 as a bonus, to employ 500 men.

The Citizens Gin Company, Texarkana, Ark., has been incorporated with a capital stock of $10,000 by A. M. McDaniel, H. Clark and F. E. Wilson and will equip a ginnery.

Jonesboro, Ark., will add one 150-hp. tubular boiler and a 100-hp. heater to its light and water plant.

The Hutson-Barker Auto Company, Newport, Ark., has been incorporated with a capital stock of $10,000 by Walker Ladd, E. A. Hirsch and Tom Barker and will equip a repair plant and machine shop.

An improvement district, No. 2, at Argenta, Ark., has been organized to acquire the Arkansas Water Company's plant at that point and to expend about $200,000 on additional equipment for the pumping station, etc.

The Arkansas Light & Power Company, Arkadelphia, Ark., will equip a power house and install electric motor driven pumps with a 24-hr. capacity of 600,000 gal. It will also equip a waterworks plant at Newport, Ark.

A waterworks plant to cost $85,000 will be erected and equipped at Stuttgart, Ark. Plans are being prepared by White, Humphreys & Tovey, Pine Bluff, Ark.

A new waterworks plant at Harrison, Ark., is to be equipped with a triplex power pump and other machinery to cost about $50,000. W. O. Galbreath, Harrison, is supervising engineer.

A plant to manufacture lawn furniture, swings, etc., is to be equipped at Glenwood, Ark., by capitalists represented by N. K. Nichols.

The Chickasha Electric Company, Chickasha, Okla., will expend about $10,000 in adding equipment to its generating plant.

Woodward, Okla., will expend about $12,500 in adding equipment to the municipal electric plant. The mayor should be addressed.

The McMahon Refining Company, J. D. McMahon chiefly interested, will equip an oil refinery at Jennings, Okla., requiring about $25,000 of machinery.

The Katy Refining Company, Yale, Okla., will expend about $20,000 on oil refinery equipment. F. S. Ayres and others are interested.

The Sapulpa Ice & Cold Storage Company, McAlester, Okla., has been incorporated with a capital stock of $55,000 by W. S. Ambrose, C. F. Fath and O. L. Alexander and will equip a plant.

The Missouri Zinc Development Company, Oklahoma City, Okla., has been incorporated with a capital stock of $80,000 by E. S. Newman, W. L. Alexander and C. W. Talbot and will purchase mining machinery, including pneumatic drills, power plant, hoisting equipment, etc.

Enid, Okla., will expend about $35,000 on waterworks improvement to increase the pumping capacity to 1,000,000 gal. per 24 hr. Cecil Harrison is engineer.

Wetumka, Okla., will expend about $40,000 on waterworks plant improvements. A. J. Cook is president of the commission in charge.

The Acme Milling Company's grain elevator at Oklahoma City, Okla., has been burned with a loss of $15,000 on machinery which will be replaced.

W. H. Fletcher, Tulsa, Okla., is reported in the market for wood-working machinery.

The Culpepper Motor Company, Meridian, Miss., has been incorporated with a capital stock of $17,500 by E. M. Culpepper and G. W. Shepherd and will equip a garage and machine shop.

The Great Southern Lumber Company, Bogalusa, La., it is reported, will build an additional mill to cost complete about $1,000,000.

The Cady Lumber Company, Lake Charles, La., will rebuild and re-equip its lumber plant recently burned with a loss of $300,000.

Lafayette, La., will expend about $18,000 for a new engine for the electric light plant and other equipment. Address the mayor.

The Iron Mountain Railway will equip a 15-stall roundhouse, machine and repair shops, mechanical coal chute, etc., at Monroe, La., to cost about $142,000. The chief engineer, St. Louis, Mo., can be addressed.

The St. Louis Felling Machine Company, manufacturer of sewing machines, St. Louis, Mo., has purchased one 2¼ x 11-in. and one 3½ x 36-in. screw machine. It plans the manufacture of an automatic valve to control the filling of laundry tubs and it expects this will necessitate installing additional automatics, etc.

Texas

AUSTIN, TEX., Aug. 28, 1916

The machinery and tool trade continues satisfactory. The recent tropical hurricane that swept over the lower Gulf coast of Texas did great damage to many industrial plants.

The Petrolia Machine Shop Company, Burkburnett, will build repair shops at a cost of about $15,500. J. L. Staley is a stockholder.

The Fort Worth Elevator Company, Fort Worth, will build an additional grain storage elevator. Loading and unloading machinery will be installed.

J. A. Fletcher and Omar Fletcher will enlarge and install machinery in the cotton gin at Temple, which they recently purchased from E. B. Greathouse.

The George West Water & Light Company, George West, will construct a waterworks and electric light plant at a cost of about $40,000. Charles Schreiner, Jr., San Antonio, is a stockholder.

J. H. Swope is organizing a local company to build a cotton mill at Houston to cost about $500,000.

Loraine, Tex., will issue $5,000 in bonds for constructing a waterworks system.

W. W. Chambers, Cameron, will build a garage and repair shop at a cost of about $10,000.

The El Paso Ice & Refrigerating Company will install new machinery in its plant at El Paso at a cost of $38,000 and will build a new cold storage plant.

Kingsville, Tex., will issue $100,000 in bonds for constructing a municipal waterworks.

It is announced that immediately following the return of the National Railways of Mexico to the owners by the de facto government of Mexico, scheduled to take place Sept. 1, large orders for materials for repairs and machinery for rehabilitating the shops at Aguas Calientes, Nuevo Laredo,

Piedras Negras and the city of Mexico will be placed. R. C. Burke, master mechanic, is now in Mexico investigating the condition of the property.

The Eagle Pass & Gulf Railroad Company will be incorporated to construct a railroad between Eagle Pass and Corpus Christi, a distance of about three hundred miles. Shops to cost about $100,000 will be built. Richard H. Phillips is chief engineer.

The Pacific Northwest

SEATTLE, WASH., Aug. 22, 1916.

The shipbuilding industry, for the past six months one of the most productive in the Pacific Northwest, seems to have only begun its phenomenal growth. Almost daily, new shipbuilding plants are rumored, and in Portland alone three plants are now under construction, which have orders booked ahead for months. Repair work has also been exceedingly heavy, and many allied industries, such as bolt and nut factories, have made their appearance, as a natural adjunct to the shipbuilding work under way. The need of ships and carriers of every kind continues very pressing, and this is particularly true in the lumber industry. Many of the larger plants are confining their work entirely to wooden vessels for the lumber trade. Threshing and harvesting in Oregon is now on in full swing, and a brisk demand exists for harvesting machinery of all kinds. Canners and packers throughout the Northwest and Alaska announce that their plants will probably be operated to practically their capacity. While extensive repair work and new construction have been done in this line, a number of the larger packers have withheld extension work until 1917, when the big year of the salmon four-year cycle is expected. The car-shortage situation in Oregon has become exceedingly grave, and the Public Service Commission has directed the railroad companies to take steps to remedy the trouble.

The Seattle Construction & Dry Dock Company, Seattle, according to statements of C. W. Wiley, vice-president and general manager, has recently closed a contract with Norwegian interests for three 7500-ton steel freight steamers at a total cost of $2,650,000. The order is the largest single contract for merchant craft ever awarded to a North Pacific shipbuilding firm.

The Washington Creosoting Company, Everett, Wash., recently organized, has purchased a site of 23 acres on the harbor front, on which a modern creosoting plant will be constructed. Geoffrey Winslow, Tacoma, is president.

John Martinolich, operating a shipbuilding plant in Tacoma, Wash., announces that he will move his business to Tacoma, where a large plant is to be constructed. Two lumber schooners are already under contract for building.

The Huffschmidt-Dugan Iron Works, Bend, Ore., whose plant was recently destroyed by fire, has started operation in a new building equipped with a number of improvements. A modern machine shop is to be added.

Construction work on the proposed milling plant to be built for the Cottonwood Milling Company, Cottonwood, Idaho, has started. The new plant will cost $25,000 and will have a capacity of 125 bbl. of flour daily and the grain elevator 50,000 bu.

The plant of the Smokeless & Sootless Coal Company, Washoe, Mont., was completely destroyed by fire recently, with a loss of $35,000. The power house and tipple were completely burned. Plans for rebuilding are now in preparation, according to J. F. Brophy, president.

The United Broom Company, Tacoma, has been capitalized for $50,000 by A. C. Mason and W. L. Hart. It is reported the company plans the construction of a manufacturing plant in Tacoma.

The Willamette Iron & Steel Works, Portland, is constructing an additional shop for building boilers, which will double the present capacity. The new plant with equipment, which includes a 20-ton traveling crane, 18-burner oil plate furnace, set of bending rolls and two high-power, high speed radial drills, will cost $100,000. It is expected to be in operation by Oct. 1. The company now has under construction at its shipbuilding plant, associated with the Northwest Steel Company, five Norwegian steamers.

The Pacific Bolt Company, Seattle, recently incorporated by John F. O'Brien and Albert J. O'Brien, has purchased a site of three acres on which a plant to manufacture bolts, spikes, nuts and rivets will be erected at a cost of $50,000. It is stated the plant will be in operation within three months and will be constructed to permit of further extensions.

J. F. Duthie & Co., Seattle, shipbuilders, have recently received a contract for three 8800-ton steel freighters to be constructed at a cost of $2,500,000. Contract was let by Hannevig & Johnson, New York, for Norwegian clients. The company's new plant will be rushed to completion.

Harry P. Edward, Tacoma, secretary of the Western Lumber & Millwork Company, with associates, has purchased the mills, yards and offices of the Keystone Lumber Company, Tacoma, which also operates a large sash and door factory. The new owners plan to make extensive improvements to its properties.

It is reported that the Northwest Steel Company and the Willamette Iron & Steel Works, Portland, Ore., have recently received contracts for the construction of three additional steel ocean going steamers representing a cost of $3,000,000. This makes a total of eight vessels contracted for, and insures operations on the present scale for at least three years.

The Crago Water Lifter Company, Sappington, Mont., has been incorporated for $250,000 by F. H. Crago and C. H. Sappington, and will erect a plant for the manufacture of the Cargo water lifter, and other devices.

George E. Hardy, Portland, Ore., is associated with a syndicate which plans the erection of a large shipbuilding plant in Portland. A number of vessels are already under contract for coast trade.

The McEachern-Standifer-Clarkson Ship Company, Astoria, Ore., has filed notice of dissolution, and articles of incorporation have been filed for the Standifer-Clarkson Company, with a capital of $160,000, by G. M. Standifer, Jesse Stearns and J. M. Robinson. It is now constructing a ship for the Libby, McNeil & Libby Company.

William Piggott, Seattle, will construct a bolt and nut plant in Seattle, at a cost of $5,000.

Canada

TORONTO, Aug. 28, 1916.

R. Neild, general manager of the Victoria Machinery Depot, Victoria, B. C., announces that his company has received another substantial order for shells. The contract calls for 20,000 high explosive shells of the 4.5-in. caliber. Work will proceed at once in changing over the plant in order to handle the larger shells so that there may be no delay when the billets arrive from the East for the new contract. It has been found, in most cases, that a delay of as much as four months has been occasioned in changing over the equipment before actual production could be undertaken. At the present time there are but four companies making forgings for the entire shell production of Canada. Their output falls far below the requirements of the factories making shells. The Imperial Munitions Board, realizing the seriousness of this drawback, has created a new office on the board, that of supervisor over the production of the forged billets from which shells are made. J. A. Kilpatrick, president and general manager of the Dominion Wheel & Foundry Company, Toronto, was appointed to the position and is formulating plans whereby new industries may be established in Canada.

E. S. Fraser, engineer, New Glasgow, N. S., is preparing plans for additions to be made to the waterworks plant and system to cost $100,000. J. Roy is clerk.

The Thomson Paper Mills, Newburg, Ont., has been purchased by Lewis F. F. Houpt of Buffalo, N. Y. Work of repairing the buildings has been commenced and the latest machinery will be installed. It will be known as the Houpt Paper Mills, Ltd., and will manufacture high grade bond paper. George B. Thomson will be resident manager, and it is understood that the plant will be ready for operation by Nov. 1. Mr. Houpt is president of the George Irish Paper Company of Buffalo, and the Monarch Paper Company of Toronto.

The Hanover Cement Company, Hanover, Ont., proposes to purchase additional machinery and equipment for its plant.

The Canadian Consolidated Rubber Company will build a large addition to its plant at St. Jerome, Que., and has awarded the contract to Gray & Dunn, Montreal.

The American Brakeshoe & Foundry Company of the United States proposes to establish a plant on Talbot Street, St. Thomas, Ont. The building will be 50 x 225 ft., one-story, and will be used for manufacturing all the company's Canadian orders, which have hitherto been manufactured in the United States. C. D. Pettit, New York, is president of the company.

Construction work will be started at once on the erection of a shipbuilding plant for Boyds, Ltd., of Port Moody, B. C., to include engineering and wood-working plants, foundry, etc.

Officials of the Canadian Car & Foundry Company, Montreal, are stated to have announced that they will have completed the original order from the Russian Government for $2,500,000 worth of shrapnel shells within three weeks.

The order for high explosive shells will be completed by the end of the year. New shell contracts have already been signed. The company's plant at Welland is booked up to the end of 1917.

Work has been commenced on the erection of shipyards on Poplar Island, in the Fraser River, by the Western Marine Railway Company of New Westminster, B. C. The plant will cost $70,000 and $15,000 worth of machinery will be installed.

With the completion of the Quebec Bridge early in September, it is understood that the St. Lawrence Bridge Company, a subsidiary of the Dominion Bridge Company of Montreal, will turn to the manufacture of 9.2-in. shells. The equipment of the plant is probably now under way.

The Canadian Chicago Bridge & Iron Company, Ltd., Bridgeburg, Ont., has been incorporated with a capital stock of $100,000 by George T. Horton, Robert H. Murray, Horace B. Horton, and others, of Chicago, Ill.; Christopher C. Gregory of Bridgeburg, Ont., and others, to manufacture tanks, iron, steel, etc.

The Boss Lock Nut Company of Canada, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Francis G. Bush, George R. Drennan, Herbert W. Jackson, and others, to manufacture nuts, bolts, fastening devices, iron, steel, etc.

The Ontario Steel Products, Ltd., is making extensive additions to its plants at Brockville, Ont., and Chatham, Ont. The company recently signed up contracts with three Canadian automobile companies which will cover production for nearly three years. In addition it has been active on war orders.

The Lincoln Electric Company of Canada, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Philip B. Wood, 332 Lippincott Street, Toronto; Clara Saccombe, George Hunt, and others, to manufacture motors, electrical appliances, machinery, etc.

The Leaside Munitions Company, with a capital stock of $250,000 has been granted a license to manufacture war munitions, shells, guns, etc., in Ontario. The company has appointed George C. Loveys, 801 Dominion Bank Building, Toronto, Ont., its attorney.

The City Council, Swift Current, Sask., will make extensive additions to its power plant. Either a gas plant to cost $100,000 or a steam plant to cost $34,000 will be constructed. J. W. Calder is engineer.

The London Rolling Mills Company, London, Ont., will build an addition to its plant and install new machinery at a cost of $50,000. Frank White is manager.

New Toronto, Ont., has granted a fixed assessment for a number of years on a factory which the Du Pont Fabrikoid Company, 864 Dufferin Street, Toronto, will erect there within a year at a cost of $150,000.

The Gray Dort Motor Company will build an addition to its plant at Chatham, Ont.

John T. Hepburn, Ltd., 18 Van Horne Street, Toronto, will build an addition to its machine shop at a cost of $3,000.

The Canadian Hanson & Van Winkle Company, 15 Morrow Avenue, Toronto, will build an addition to its foundry at a cost of $7,000.

The Canadian Bag Company, Montreal, will erect a factory on Paton Road, Toronto, to cost $40,000.

The Rawdon Machine Company, 163 Sterling Road, Toronto, will build an addition to its plant to cost $2,000.

Alfred A. Viau, St. Jerome, Que., has commenced the erection of a foundry.

The Acme Stamping & Tool Company, Ltd., Sydney Street, Hamilton, is having plans prepared for the erection of an addition to its plant.

The Dunlop Tire & Rubber Goods Company, 224 Booth Avenue, Toronto, proposes to erect a new factory building of brick and mill construction.

The Union Drawn Steel Company, Victoria Avenue South, Hamilton, will have an addition erected at its plant to cost $5,000.

The Thompson Norris Company, 355 Notre Dame Street East, Montreal, has let a contract for the construction of a reinforced concrete and brick paper factory and power house to cost $84,000. Lockwood & Greene, Boston, Mass., are the architects.

MacKinnon, Holmes & Co., Sherbrooke, Que., have let a contract for the extension of their forge shop at a cost of $5,000.

The Dominion Steel Products Company, Brantford, Ont., has commenced the erection of a plant for the manufacture of steel products. The building will be of steel and glass, 90 x 370 ft., and will cost $65,000. The contract for the construction of the plant has been let to the Austin Company, Cleveland, Ohio.

The Corrugated Paper Company, Ltd., 187 Geary Avenue, Toronto, Ont., has let a contract for the erection of a brick and steel addition to its plant to cost $12,000.

C. B. Dayfoot & Co., Georgetown, Ont., are in the market for a 20 to 35-hp. boiler to stand government inspection of 60 lb. pressure.

Plans have been completed by the Adams Harness Company, 204 King Street East, Toronto, for the erection of a reinforced concrete factory building to cost approximately $80,000.

Government Purchases

WASHINGTON, D. C., Aug. 28, 1916.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 43, for one heavy-duty engine lathe for Puget Sound; schedule 45, one 10-hp. induction motor; schedule 46, fifty ¼-hp. 120-volt, direct-current motors; schedule 49, one pressure blower with 12-in. outlet; schedule 54, thirty-five 4-in. and 6-in. handybilly pumps and schedule 68, five 120-volt, direct-current blowers, all for Brooklyn; schedule 70, for one 10-kw. electrolytic generator for Newport.

The commanding officer of the Frankford Arsenal, Philadelphia, will receive sealed proposals until 10 a. m., Sept. 5, under proposal 66, for furnishing one 500-ton hydraulic press for loading shell with high-explosive charges, together with appropriate pumps and accumulators.

The general purchasing officer of the Panama Canal will receive proposals under Panama circular 1075, class 28, until 10.30 a. m. Sept. 14, for three refrigerating machines.

The following bids were received by the chief of ordnance, Navy Department, Washington, Aug. 23, for furnishing projectiles:

9000 14-in. armor-piercing shell—Bid 5, for 3000 only, $524 each; 8, for 2000 only, $529.75 each; 9, for 3500 only, $492 each; 21, for 3000 only, $535 each.

2800 14-in. class B shell—Bid 5, for 500, $300 each; 8, for 500, $327.50 each; 9, for 1000 only, $320 each; 21, $302 each.

31,500 6-in. common—Bid 4, $27.50 each; 7, $31 each; 10, $24.50; 11, for 4000, $24.76 each; 15, $24 each; 18, 1500 at $17.75 each, 5000 at $19.75 each, 5000 at $21.75 each, 20,000 at $23 each; 20, 10,000 only, $32.75 each; 21, $33 each; 24, $18 each.

185,600 5-in. common—Bid 4, $11.70 each, $12.25 each for 150,000; 7, 100,000 only, $14.25 each; 10, $16 each; 19, $13.35 each, slings and plating omitted deduct 30 cents; 20, 100,000 only, $13.90 each; 21, $15 each; 24, $14 each.

139,529 4-in. common—Bid 1, $8 each; 4, $9.50 each, $10.50 each for 50,000 to 25,000; 6, $8.45 each; 7, $11.60 each; 10, $11.25 each; 12, $8 each; 14, own design, $7.25 each, government design, $7.50 each; 20, 40,000 only, $11.05 each; 21, $11.20 each; 24, $9.50 each.

300,000 3-in. common—Bid 1, $3.25 each; 2, $5.94 each and $4.86 each; 3, $3.75 each; 4, $3.75 each, $3.90 each for 200,000, and $4 each for 100,000; 7, $4.25 each; 10, $4.75 each; 12, $5.25 each; 13, $4.65 each; 14, own design, $4.625 each, government design, $4.75 each; 17, for 100,000 only, $4.90 each; 21, $3.95 each; 22, $3.15 each; 23, $3.53; 24, $6.50 each.

87,500 1-pounder anti-aircraft—Bid 10, $1.10 each; 21, 74 cents each.

187,500 1-pounder common—Bid 4, 90c. each; 10, 75c. each; 16, 79c. each; 21, $1.05 each.

The names of the bidders and the numbers under which they are designated in the above lists are as follows:

Bid 1, Acme-Harvester Company; 2, Industrial Works; 3, John Thompson Press Company; 4, Bridgeport Projectile Company; 5, Crucible Steel Company of America; 6, Harrisburg Pipe & Pipe Bending Company; 7, E. W. Bliss Company; 8, Midvale Steel Company; 9, Washington Steel & Ordnance Company; 10, Edwards Valve & Mfg. Company; 11, Huntington Alloy Company; 12, Worthington Pump & Machinery Corporation; 13, S. A. Woods Machine Company; 14, Automatic Transportation Company; 15, Minneapolis Steel & Machinery Company; 16, Poole Engineering & Machine Company; 17, General Ordnance Company; 18, Latrobe Tool Company; 19, Ingersoll-Rand Company; 20, Cram-Hoadley Company; 21, Bethlehem Steel Company; 22, American Car & Foundry Company; 23, Pressed Steel Car Company; 24, Cleveland Crane & Engineering ompany.

NEW TRADE PUBLICATIONS

Ball Bearings.—S. K. F. Ball Bearing Company, Hartford, Conn. Pamphlet No. 70, entitled, "Better Electric Motors." Covers the application of ball bearings to electrical machinery. In addition to describing a number of applications and illustrating them the features of reduced maintenance, durability, compactness and efficiency are touched upon. Instructions for mounting the bearings are also included.

Taps.—Greenfield Tap & Die Corporation, Greenfield, Mass. Bulletin. Concerned with a new form of tap in which the chips are forced out of the hole ahead of the tap instead of curling up in the flutes. A number of engravings showing the chips produced by the tap and some of the tests to which it has been subjected are presented, together with engravings of the tap itself. An illustrated description of the tap appeared in THE IRON AGE, Aug. 3, 1916.

Oxy-Acetylene Welding and Cutting.—Davis-Bournonville Company, Jersey City. Pamphlet. Gives in some detail the application of oxy-acetylene welding and cutting to gray iron and steel foundries and the sheet metal industry, as presented in a paper before the Detroit Foundrymen's Association. The methods of manufacturing the gases employed are touched upon, followed by a description of the welding and cutting torches employed. General information on such subjects as expansion and contraction, preheating, proper size of flame, the precautions to be used with iron and steel, etc., are included.

Foundry Equipment.—Illinois Mfg. & Supply Company, Quincy, Ill. Catalog No. 10. Relates to a line of foundry equipment, which includes exhaust tumbling mills, steel case dust arresters, water cinder mills, exhaust fans and sand mixing facing sand and reclaiming core sand. A brief descrippresented, together with brief description of the essential features.

Power Presses and Blue Printing Machine.—Buckeye Engine Company, Salem, Ohio. Catalog and folder. The first deals with power presses, shearing machines, dies and other metal working machinery, a section of the catalog being devoted to each particular type of press or machine. Specification tables covering the various sizes of each that can be furnished are given, followed by illustrations and brief descriptions of the machines making up the line. A number of engravings of work that has been done with the company's presses and dies are included, as well as a number of tables of useful information. The folder treats of a vertical blueprint machine using an arc light, which is automatically cut out of the circuit when it reaches the bottom of the cylinder.

Sand Mixing Machinery.—National Engineering Company, Chicago. Pamphlet. Shows a machine adapted for mixing facing sand or reclaiming core sand. A brief description of the machine is presented, together with instructions for its use. The economies of using a mixing machine to combine old and new sand are briefly touched upon, and mention is made of a screen separator.

Electric Traveling Cranes.—Shepard Electric Crane & Hoist Company, Montour Falls, N. Y. Bulletin No. 1004. Contains several engravings of the cranes installed in the new laboratories of the Massachusetts Institute of Technology and two engravings of a typical hoisting unit and the standard bridge drive and truck construction. The special features of these cranes, such as automatic lubrication, permanent alignment, complete inclosure of moving parts and ready accessibility for inspection and repair, are touched upon.

Pipe Fittings and Valves.—Pittsburgh Valve & Fittings Company, Barberton, Ohio. Catalog D. Presents illustrations, dimension tables and price lists of an extensive line of iron pipe fittings, brass and iron valves, cocks, etc., for steam, gas, water and oil. There is practically no text in the catalog, reliance being placed upon the engravings to tell the story. A number of tables of useful information and alphabetical and numerical indices are included.

Oil Burners for Foundries.—Hauck Mfg. Company, 140 Livingston Street, Brooklyn, N. Y. Bulletin No. 69. Points out the advantages of using the company's foundry burners for lighting cupolas, heating ladles and skin drying molds. Views of the operations and also of the apparatus supplement the text description and tables of the various sizes that can be supplied are included.

Boiler Tube Cleaners.—Lagonda Mfg. Company, Springfield, Ohio. Catalog L-9. Size, 7¾ x 10¼ in.; pages, 36. Illustrates and describes various sizes of water, steam and air driven tube cleaners for water tube and return tubular boilers. The advantages of using tube cleaners for removing boiler scale are touched upon. The several cutter heads supplied are illustrated and briefly described, and this is followed by engravings and descriptions of the different cleaners. Mention is made of special cleaners and a line of boiler room specialties, all of which are illustrated and described. An illustrated list of repair parts for the various cleaners and cutter heads is included.

Galvanized Sheets.—American Sheet & Tin Plate Company, Pittsburgh. Booklet. Illustrations and descriptive matter explain the uses to which the company's plain galvanized and copper steel galvanized sheets may be put. The illustrations include culverts, fence posts, tanks, flumes, roofing, skylights and fences. Tables of weights of the flat sheets and formed products that can be furnished are included.

Steel Grit and Concrete Hardener.—Pittsburgh Crushed Steel Company, Pittsburgh. Two circulars. The first relates to Angular Grit for use as a substitute for sand in cleaning castings. Among the advantages claimed for it are freedom from pulverization and breaking down, rapidity of cleaning, smoothness of surface secured and the elimination of sand storage bins and dryers. The other folder describes Resisto concrete floor hardener and facing, which is designed to make concrete floors, dust, water and oil proof. The uses of this material, which is a metallic product specially manufactured and treated so that it mixes readily with cement and sand and can be used either when new floors are being laid or old ones repaired, are briefly described.

Steel Shelf Construction.—Wallace Supplies Mfg. Company, 412 Orleans Street, Chicago. Bulletin No. 11. Describes and illustrates a line of steel shelf construction consisting of iron pipe stanchions, angle iron brackets and flat steel strips for the shelving. Among the advantages claimed for this construction are interchangeability, adjustability and cleanliness. Engravings of the various types that can be supplied are presented with brief descriptions. Tables of the various sizes of brackets that can be furnished are also given.

Stencil Cutting Machine.—Ideal Stencil Machine Company, Belleville, Ill. Pamphlet entitled, "Safeguarding Your Shipments." Mentions the advantages to be derived from plain and legible marking of shipments and shows how the work can be done easily and cheaply by the use of machine-cut stencils. Brief descriptions of the machine and the way in which it operates are given, and a number of testimonial letters from users are included.

Centrifugal Pumps.—Pelton Water Wheel Company, Nineteenth and Harrison streets, San Francisco. Bulletin No. 9. Describes a centrifugal pump which is made in eleven sizes, ranging in capacity from 30 to 4500 gal. per minute. Among the features of the pump are the uni-diffusion system of the volute, an overhung pulley mounting and interchangeability between the belt-driven and direct-connected styles. Illustrations of the various pumps are included, together with condensed specification tables.

Vertical Gang Drilling Machine.—Silver Mfg. Company, Salem, Ohio. Circular F152. Presents illustrations of a 20-in. upright gang drilling machine that is made in a number of different table arrangements. The special features of the drill are a separate column and table for each of the two, three or four spindles and the use of a single-belt drive for the countershaft with individual drive for each drill. Condensed specification tables are included.

Water Purification Systems.—Wm. B. Scaife & Sons Company, 221 First Avenue, Pittsburgh. Catalog entitled, "Water Purification for All Purposes." Illustrates the various types of water softening and purifying apparatus made and the application of water purification to different industries. Analyses from various water supplies throughout the United States are included, together with miscellaneous data for calculating the water requirements for different purposes. In addition to illustrations of the apparatus, a number of views of illustrations are included.

Electric Light and Power Wiring.—L. K. Comstock & Co., 30 Church Street, New York City. Bulletin No. 1. Devoted to the part played by the electrical distribution system in a factory. The various features that are desirable in such a system, such as safety, reliability, flexibility, etc., are touched upon with particular reference to the facilities of this company along these lines. A number of views of installations and buildings that have been wired are included.

Employees of the Chesapeake Iron Works, Westport, Md., and their families, were given an all-day outing by the company on Aug. 26. Special cars carried them to a park on Middle River, where athletic events were held and refreshments served.